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The Province of Alberta

PETROLEUM AND NATURAL GAS CONSERVATION
BOARD

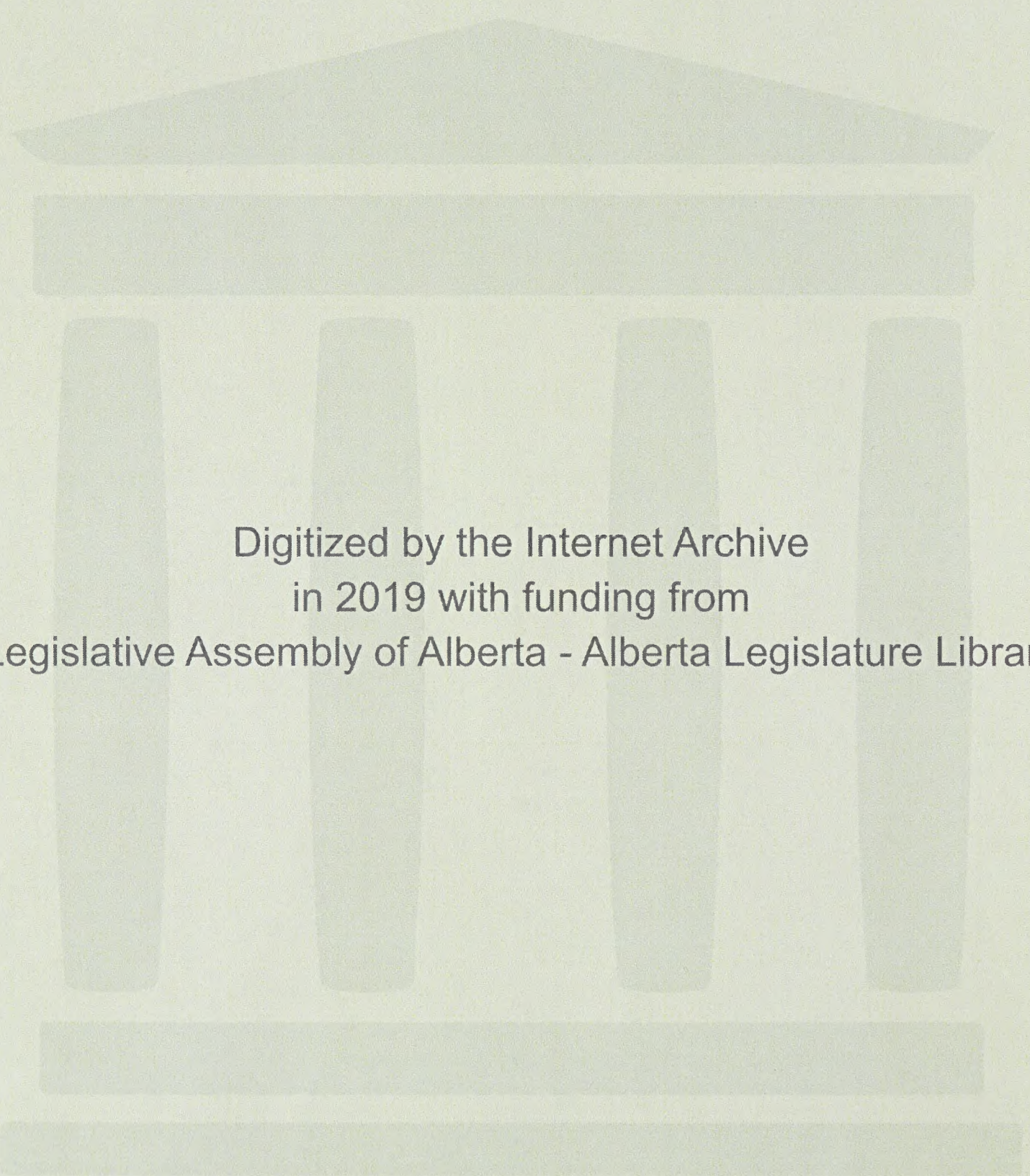
IN THE MATTER OF THE GAS RESOURCES PRESERVATION ACT

AND IN THE MATTER of a Joint Hearing to determine various questions
relating to the proposed Export of Natural Gas from the Province of Alberta.

I. N. McKinnon Esq., Chairman
D. P. Goodall Esq.
Dr. G. W. Govier

Session: December 11th, 1951.

Volume 31.



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MR. HENDRICKS:

Mr. Chairman, I call Mr.

Ten Broeke.

MR. C.E. SMITH:

I notice Mr. Gladstone Porter

is not here this morning.

HENRY TEN BROEKE, having
been first duly sworn, examined by Mr. H.J.W. Hendricks, testi-
fied as follows:

Q Mr. Ten Broeke, I understand you graduated from the
University of Delft in the Netherlands in mining engineer-
ing in 1928?

A That is correct, sir.

Q And that you then joined the Royal Dutch Shell group in
The Hague as exploitation engineer in that year?

A That is correct, sir.

Q And have you since been employed by one or more of the
Shell group of companies since that time?

A That is right.

Q Would you tell the Board briefly your experience with the
Shell group since that time?

A In June 1928 I went to the Dutch East Indies as exploitation
engineer in the oil fields of Java and Borneo. In 1930 I
returned to The Hague. In February 1931 I went to the
United States and until 1935 was exploitation, production
and sub-surface engineer in the oil fields of East Texas
and West Texas and in the Houston, Texas, and Tulsa,

Henry Ten Broeke,
Mr. H. M. Hendricks.

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MR. HENDRICKS:

Ten Broeke.

MR. C. E. SMITH:

is not here this morning.

Mr. Hendricks, I understand you graduated from the

I notice Mr. Hendricks is not here this morning.

HENRY TEN BROEKE, having

been first day, sworn, examined by Mr. H. M. Hendricks, and

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University of Delft in the Netherlands as mining engineer-
ing in 1928?

A That is correct, Mr. H. M. Hendricks.

Q And that you then joined the Royal Dutch Shell group in

The Hague as exploration engineer in that year?

A That is correct, Mr. H. M. Hendricks.

Q And have you since been employed by one or more of the

Shell group of companies since that time?

A That is right.

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and West Texas and in the Houston, Texas, and Tulsa,

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Oklahoma, offices. In December of 1938 I went back to The Hague. In May of 1936 I went to Argentina as exploitation engineer. In February 1937 I went back to the United States and worked at sub-surface engineering in Tulsa, Oklahoma, and Wichita Falls, Texas. In April 1943 I went to London, England, where I worked in the London office on report, repair and the rehabilitation of oil fields in Indonesia. In September 1944 I returned to the United States as division exploitation engineer in Illinois. In November 1945 I went to Wichita, Kansas, as division exploitation engineer. In May 1949 I went to the regional office in Houston, Texas. In January 1950 I was made chief exploitation engineer in Houston, which position I held until January 1951, when I was transferred to Calgary as chief exploitation engineer of the Calgary area.

MR. HENDRICKS: Mr. Chairman, there are one or two things I think I should perhaps point out at this stage. In the first place, Shell Oil Company is producing this witness voluntarily to give evidence of certain factual information regarding the Jumping Pound field and also to give the company's estimate of the producible reserves in that field. I would like to emphasize that Shell, in appearing here, does not wish to appear as associating themselves with the exponents or opponents of export of gas.

 I would also like to point out, sir, that in, I think, the winter of 1948-49, I believe it was Mr. McDonald, who was counsel for the Dinning Commission, asked Shell to make a witness available for the Commission on the matter of Jumping Pound. At that

Henry Ten Brink
Dir. Ex. by Mr. Huddleston

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as chief exploitation engineer of the Calgary area.
Mr. HENNINGSEN:
Mr. Chairman, there are one
or two things I think I should perhaps point out at this
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this witness voluntarily to give evidence of certain
technical information regarding the Lumping Pound field and
also to give the company's estimate of the production re-
serves in that field. I would like to emphasize that
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the Commission on the matter of Lumping Pound. At that

Henry Ten Broeke,
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time Shell had almost entirely withdrawn from Western Canada in exploration and there were only one or two very junior people here, neither of whom could appear as witnesses or as a witness, and the people who had been in the organization were so far away and so tied up with their new duties that it was not feasible for the company to produce a Shell employee, and we therefore secured the services of Dr. John Dodge, made available to him in Los Angeles, where our reports had been sent, all the information and data relating to the Jumping Pound field. He acquainted himself with the information we had and appeared before the Dinning Commission to give evidence.

I point that out for this reason, that since Dr. Dodge gave his evidence before that Commission Shell has re-entered the play in Alberta and Western Canada and in the Jumping Pound field particularly has drilled several wells and has, by the use of equipment and perhaps techniques which were not available earlier, obtained information which was not obtainable when we did our earlier work in the Jumping Pound field. Shell has put Mr. Ten Broeke on the stand as our senior man in our exploration engineering organization in our Calgary area which covers all of Western Canada. I would like, first, sir, to deal with the matter of porosity.

Q Mr. Ten Broeke, I understand you have in your possession certain information on porosity in the Jumping Pound field. Would you please present such information to the Board and also describe the method which has been used in determining the average porosity at Jumping Pound.

A There are two periods of development in Jumping Pound.

Henry Ten Broeke
Dit. Ex. by Mr. Hendricks

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time Shell had almost entirely withdrawn from Western Canada in exploration and there were only one or two very junior people left, neither of whom could appear as witnesses at a witness, and the people who had been in the organization were so far away and so tied up with their new duties that it was not feasible for the company to produce a Shell employee, and we therefore secured the services of Mr. John Dodge, made available to him in his capacity, where our reports had been sent, all the information and data relating to the Jumping Pound field. He acquainted himself with the information we had and appeared before the Mining Commission to give evidence.

I point that out for this reason, that since Mr. Dodge gave his evidence before that Commission Shell has re-examined the play in Alberta and Western Canada and in the Jumping Pound field particularly has drilled several wells and has, by the use of equipment and perhaps techniques which were not available earlier, obtained information which was not obtainable when we did our earlier work in the Jumping Pound field. Shell has put Mr. Ten Broeke on the stand as our senior man in our exploration engineering organization in our Calgary area which covers all of Western Canada. I would like, first, to deal with the matter of potential.

Mr. Ten Broeke, I understand you have in your possession certain information on potential in the Jumping Pound field. Would you please present such information to the Board and also describe the method which has been used in determining the average potential at Jumping Pound.

There are two periods of development in Jumping Pound.

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In the older period of 1944 to 1947 Shell drilled and completed two producing wells, 4-24-J and 5-7-I. The development of the diamond core bell was not yet sufficiently advanced at this time. Shell attempted to core the Rundle productive section with a conventional core bell but this was entirely unsuccessful and the attempts were discontinued. There is therefore on these older wells no reliable core data available on the productive section.

In the second period, Shell drilled and completed three productive wells, 5-13-J, 1-26-J and 10-6-I. In these wells we drilled a few feet into the Rundle, cemented the pipe and then diamond cored through the entire productive section. The intervals cored, sections cored, were as follows: 7-13-J, 9,616 to 9,860, a section of 244 feet, of which we recovered 70 per cent; 1-26-J, 10,047 to 10,393, a section of 246 feet, of which we recovered 72 per cent; 10-6-I, 9,704 to 9,972, an interval of 268 feet, of which we recovered 89 per cent.

The recovered cores were analyzed by a service company, Core Laboratories, in a conventional manner for porosity and permeability. The analyses were carried out on full cores, in other words, not on small plugs cut from the core. Essentially the method of core analysis was followed of the U.S. Bureau of Mines Monogram R.I.-4548 of September, 1949. In determining the net pay interval only those parts of the Rundle section were considered which showed a porosity of over 5 per cent and a permeability of more than 1 millidarcy. This was done because we feel that as far as Jumping Pound is concerned it is questionable whether anything, say,

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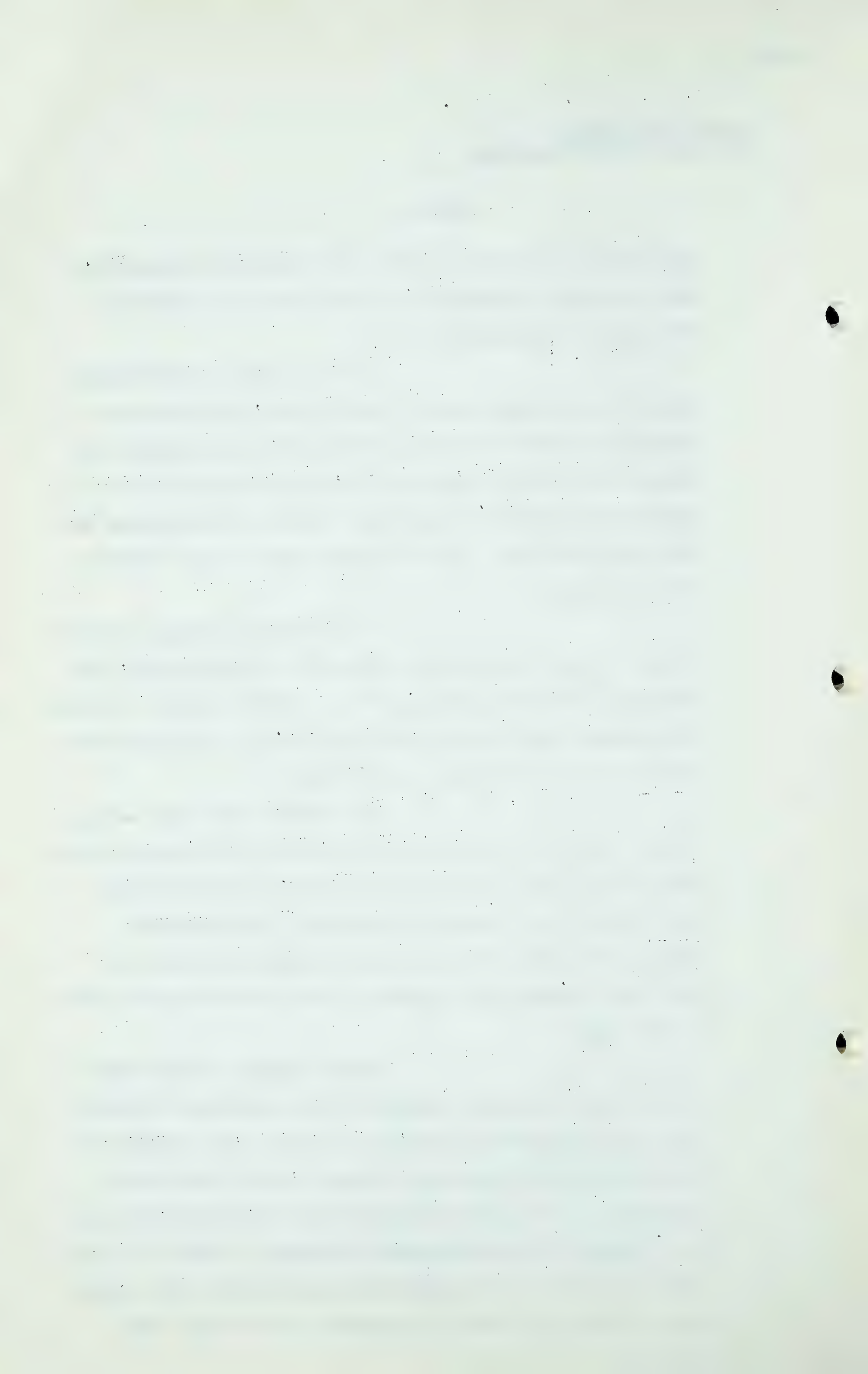
less than 5 per cent porosity or 1 millidarcy permeability will contribute materially to the producible reserves. This may be conservative.

The porosity of the missing intervals, in other words, the intervals which were not recovered during the coring operations, was estimated by comparison with the recovered cores and with the aid of Schlumberger Surveys, micrologs, the Lane Well Surveys and drilling time data. In this manner the net pay interval was determined.

The weighted average porosity of the net pay interval was calculated by multiplying the footages of the composing parts with their porosity, adding the product just obtained, and dividing this figure by the total footage of the net pay interval.

As regards the older wells, 4-24-J and 5-7-I, the drill cuttings and drilling time data were re-examined in the light of our new experience and the total net pay interval determined. The weighted average porosity of the net pay interval of 4-24-J and 5-7-I was estimated as the mean of the offsetting two wells in each case.

Shell logging experts have studied the electrical surveys of four wells and estimate that the connate water content of the net pay interval of the structurally high wells, 10-6-I, 5-7-I, and 7-13-J, should be on the order of 10 per cent, and that of the net pay interval of the structurally low well, 1-26-J, 30 per cent. In view of its high structural position the connate water content for 4-24-J is assumed to be 10 per cent.



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We now have the following data: 10-6-I, net pay interval 165 feet, weighted average porosity 8.25 per cent, connate water 10 per cent, porosity range above base level 5 to 19.4 per cent, permeability 1 to 197 millidarcies; 5-7-I, net pay interval 130 feet, weighted average porosity 8.0 per cent estimated, connate water 10 per cent; 7-13-J, net pay interval 130 feet, weighted average porosity 8.0 per cent, connate water content 10 per cent, porosity range above base level 5 to 15.1 per cent, permeability above base level 1 to 105 millidarcies; 4-24-J, net pay interval 150 feet, weighted average porosity 7.75 per cent estimated, connate water content 10 per cent estimated; 1-26-J, net pay interval 160 feet, weighted average porosity 7.50 per cent, connate water content 30 per cent, porosity range above the base level 5 to 12.4 per cent, permeability range above base level 1 to 183 millidarcies. The average of these 5 wells is as follows: net pay interval 147 feet, weighted average porosity 7.90 per cent, connate water content 14 per cent, Based on pressure data obtained while running the water hole pressure bomb in 4-24-J and 5-7-I, the reservoir pressure of the Jumping Pound field is estimated at 3980 pounds per square inch gauge, at the datum level of 5850 feet subsea.

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Based on temperature data obtained while running bottom hole pressure bomb in 4-24-J and 5-7-I, the reservoir temperature is estimated at 194° Fahrenheit. The compressibility factors are calculated from complete gas analyses by the so-called pseudo-critical method. At the initial reservoir pressure of 3980 pounds per square inch, and initial temperature of 194° Fahrenheit, the factor is calculated to be .902, and at the abandonment pressure of 400 pounds per square inch .968. The producible gas reserves per acre to an abandonment pressure of 400 pounds per square inch gauge, and based on average well conditions, were calculated in the conventional manner to be about 96 million cubic feet. And, similarly, the amount of raw gas in place was calculated at about 106 million cubic feet per acre.

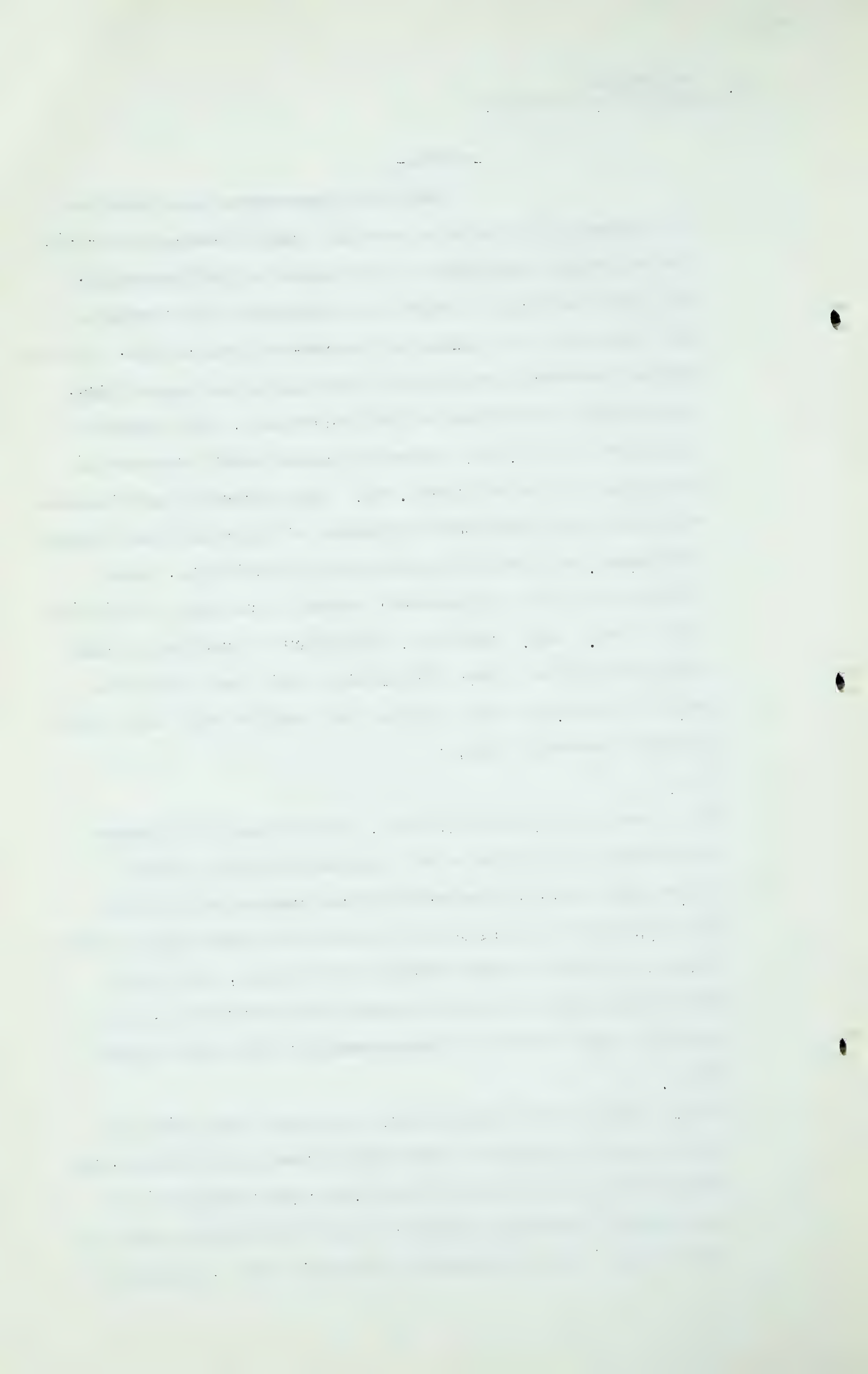
Q Mr. Ten Broeke, you have pointed out that in that field there are five producing wells?

A Yes.

Q And I ask you, in your opinion, has the Shell Oil Company established the limits of the Jumping Pound gas field?

A No, we feel that by the drilling and completion of these five productive wells we have definitely established a proven productive area of approximately 2400 acres, down to an abandonment pressure of 400 pounds per square inch, and a producible gas reserve of approximately 231 billion cubic feet.

Q On the basis of the opinion which you have just given, of the information which you have just given to the Board, and other information which you have, and your examination of the Company's seismic interpretation of the field, what is your estimate of the probable productive area, including



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the 2400 acres of proven area, and what is your estimate of the reserves of gas contained in the total area?

A I have examined the seismic interpretation, and I have come to the conclusion that the probable productive area should cover approximately 6000 acres, and should contain to an abandonment pressure of 400 pounds per square inch, and applying the data develop for the proven area, a producible gas reserve of 576 billion cubic feet.

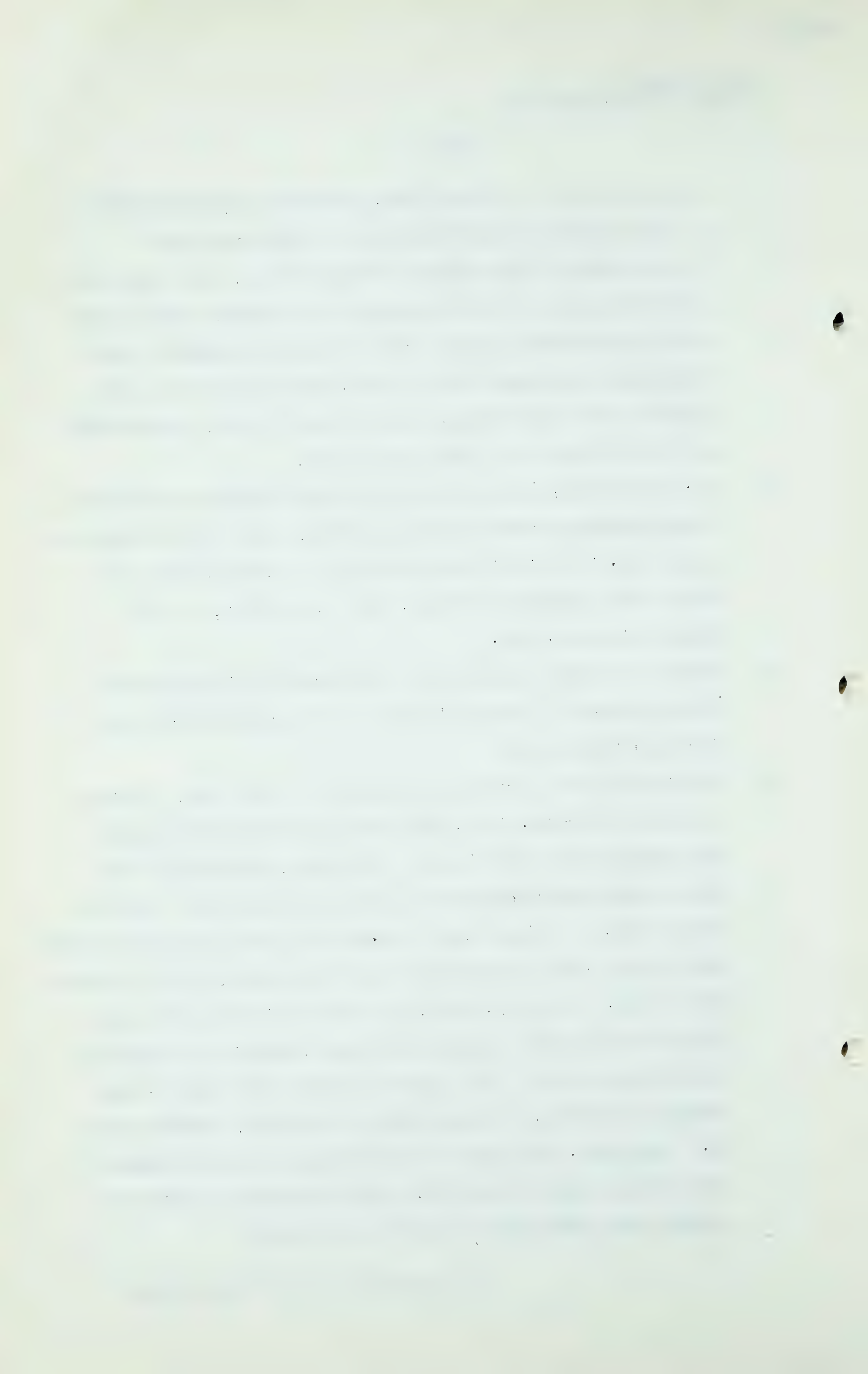
Q Mr. Ten Broeke, is it not a fact that Shell has constructed a gas treating plant at Jumping Pound, which is presently in operation, and from which deliveries of dry gas are to be made to the Canadian Western, that is correct, is it?

A That is correct, sir.

Q Would you please describe to the Board Shell's experience in the matter of service losses of gas produced from the Jumping Pound field?

A We started plant operations in April of this year. During a period April-May, 1951, the raw gas intake of the plant was approximately 600 million cubic feet, and the dry gas sales approximately 462 million cubic feet, giving a service loss of 23%. During June the raw gas intake was approximately 499 million, and the dry gas sales 404 million, with a service loss of 19%. In July, 1951, the raw gas intake was about 403 million and the dry gas sales approximately 328 million, the service loss of 19%. August of this year, the raw gas intake 447 million, dry gas sales 371 million, service loss 17%. September, raw gas intake 430 million dry gas sales 353 million, service loss 19%. October intake 604 million, dry gas sales 505 million, service loss 16%.

The average over the whole period



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amounts to about, intake 2984 million, dry gas sales 2421 million, and service loss, an average service loss of 19%. If we exclude the period from April-May, when the plant got under way, and there may have been a certain amount of flaring, we get the following figures: Intake 2383 million, sales 1959 million, average service loss 18%.

Q Excuse me, Mr. Ten Broeke, unfortunately we do not have the figures for November production and treatment, but I think the weather in November was no more severe than in October, and the November figures probably would not have added much to the calculation. We can present those as soon as they are available. I am sorry, Mr. Ten Broeke, go ahead?

A I just finished concluding that.

Q That is all on the matter of service loss?

A Yes.

Q Mr. Ten Broeke, with the service losses, what would be the marketable reserve of gas in the field?

A The marketable reserve should be about approximately 80%, or applying that to the total productive area, we would get 80% of 576 billion, or about 461 billion.

Q What is your estimate of the amount of raw gas in place?

A If we applied the factor of 106 million per acre, we would get a figure of 636 billion for the probably productive area.

Q Now, Mr. Ten Broeke, you told the Board that you estimate the probable productive area, including the 2400 proven acres, to contain about 6000 acres. What is your view as to the possibility of this probable productive area being materially larger or smaller than 6000 acres?

A In my opinion, and based on the present available information, I consider anything materially over 6000 acres to be

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entirely speculative. On the other hand, I do not think
a at this time that the total probable productive area should
be much less than 6000 acres.

Q In this work in the field, Mr. Ten Broeke, has the Company
made any back-pressure flow tests?

A We have made a small number of tests.

Q And have you run the bottom hole pressure bomb in any of the
wells?

A We have run the bottom pressure bomb in 4-24-J and 5-7-I.

Q You do not have a great deal of back-pressure data available?

A That is correct, sir.

Q Would you explain to the Board why there is not more data
available at this time?

A The reason is twofold: We have experienced great difficulty
in the past of losing the bottom hold pressure bomb in the
hole because of corrosion, and the main reason is that only
lately that we have had a sufficient surplus obtained in
the field to take the tests without jeopardizing anything.

Q Does the Company plan additional testing?

A Yes, we plan to test all our five productive wells. We also
intend to run the bottom hole pressure bomb in at least one
of the others, and we intend to accumulate P.V.T. data, as
we do at this time not have reliable P.V.T. data.

Q Now, would you please give the Board the data which you do
have on back-pressure tests?

A Open flow potentials have been obtained on wells 4-24-J and
5-7-I, and 7-13-J, using the back-pressure method as
approved by the Texas Railroad Commission. The bottom hole
pressure was run in 4-24-J and 5-7-I. Short flow tests,
not stabilized, have also been run on 1-26-J, and 5-7-I,

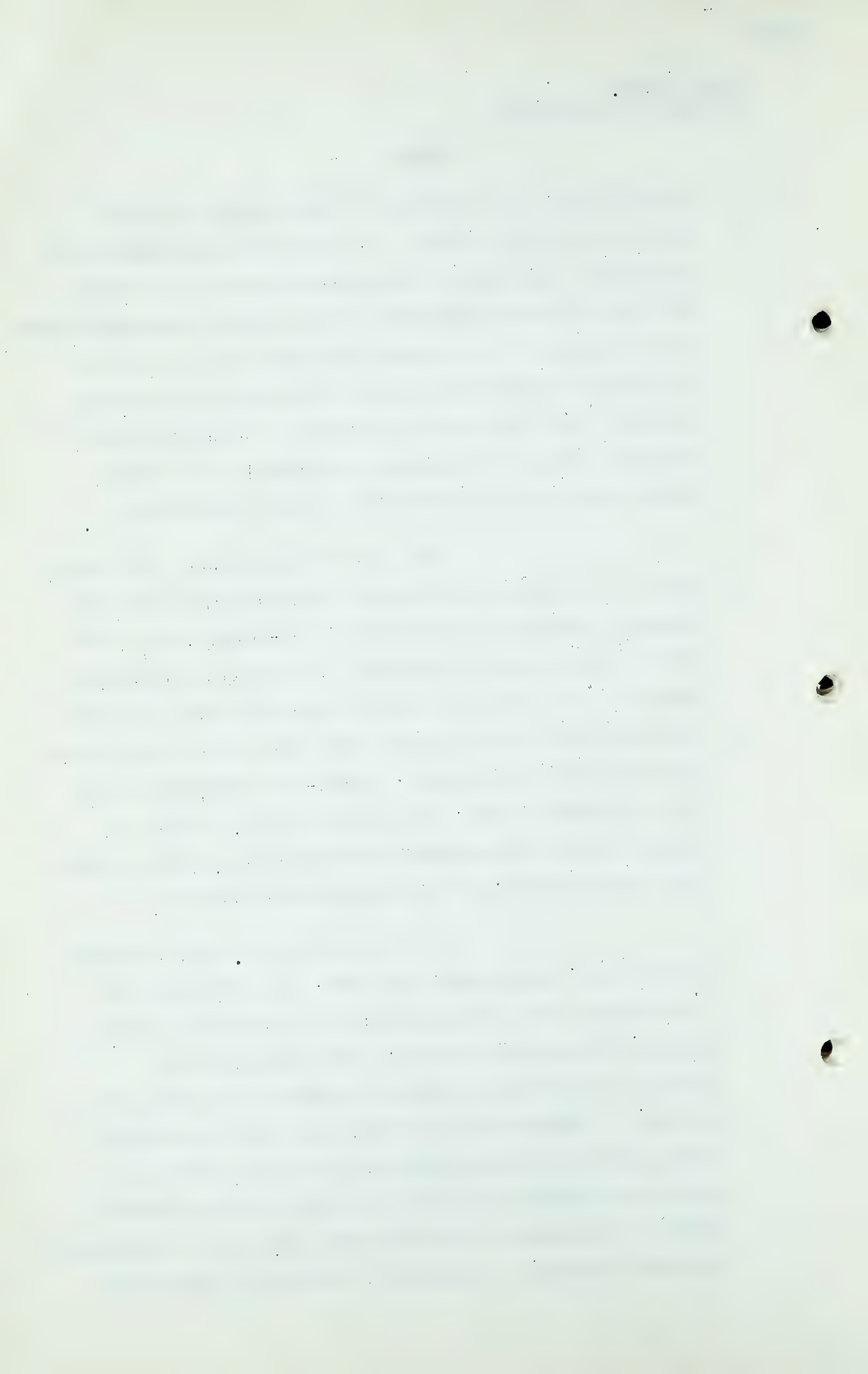
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shortly after the completion of these wells, prior to making the official tests. The open flow potentials were calculated, applying the back-pressure method as used by The Texas Railroad Commission. This entails measuring tubing head pressure at 3 or 4 stabilized flow rates, followed by a shut-in period to determine the shut-in bottom hole pressure. The bottom hole pressures are calculated from measured tubing hole pressures according to the Vitter method using the Millar friction factor modification.

The open flow potentials were determined in the conventional manner by plotting PF^2 minus P_s^2 along the ordinate of logarithmic co-ordinate paper, and the flow rate along the abscissa, then extrapolating to P_s equals 0. The slope of the back pressure curve was also determined and will be given as the angle of the curve with the horizontal co-ordinate. 4-24-J was completed at the end of December, 1944. In January, 1945, a series of flowing bottom hole pressure tests were run, using a bottom hole pressure bomb, and the flowing data obtained.

At a flow rate of 4.7 million cubic feet per day, the pressure was 3080; at a flow rate of 7.56 million, the pressure 2380; at a flow rate of 11.2 million, the pressure of 1510; from these data we estimate an open flow potential of $17\frac{1}{2}$ million cubic feet per day. Between 1945 and 1948, this well was used to supply gas for drilling purposes, and in May, 1948, an open flow potential test was made using the back pressure method. The datum of 9740 feet was used, and the following data were obtained: Flow rate 7.4 million, tubing head



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pressure in pounds per square inch absolute, 2363; flow rate of 5.998, pressure 2483; flow rate 4.24, pressure 2618; flow rate 2.902, pressure 2713; flow rate 1.718, pressure 2808; shut-in pressure 3005.

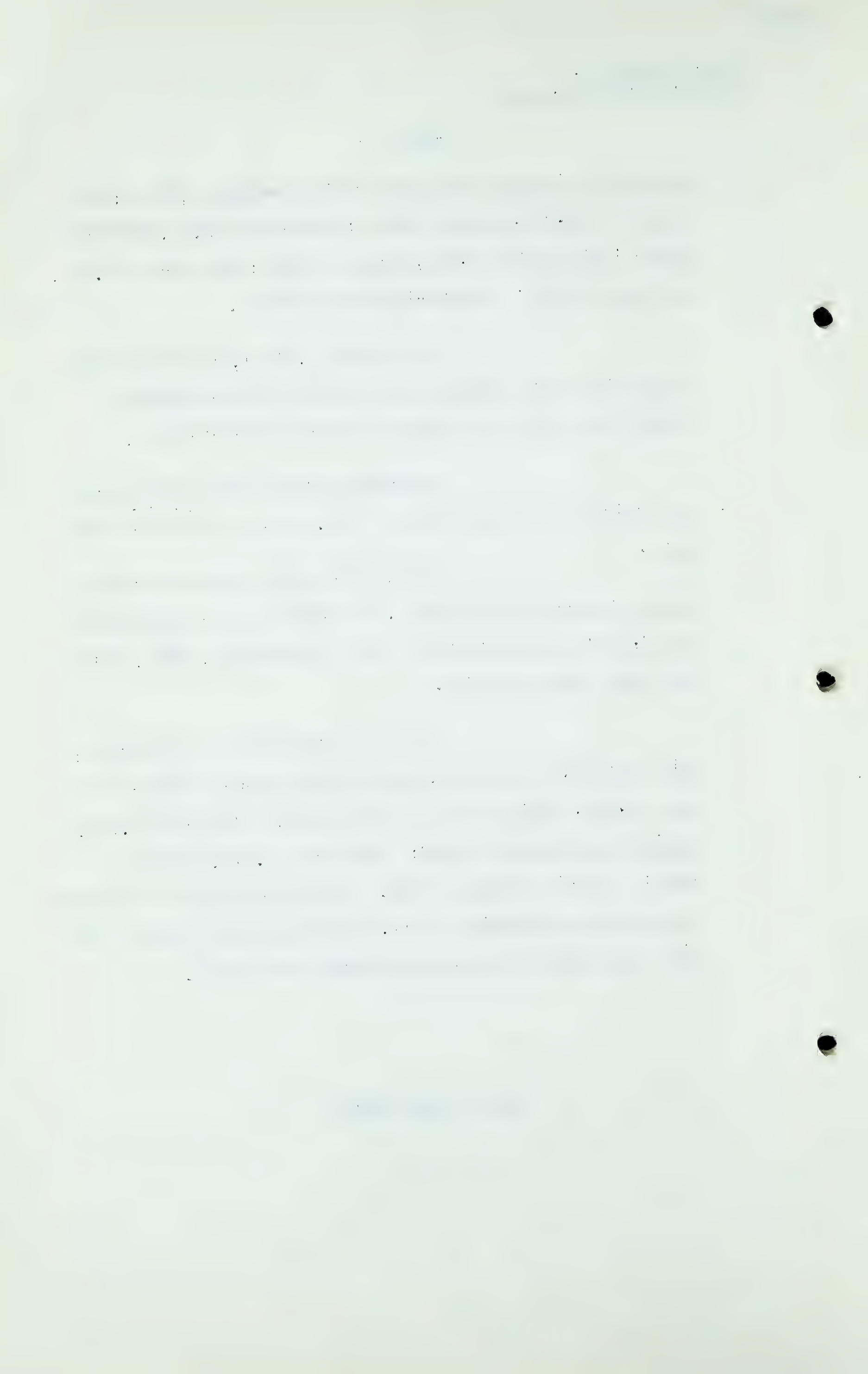
In January, 1951, the bottom hole temperature was measured and found to be considerably higher than had been estimated from electric logs.

Recalculating the data just given, we calculated an open flow of 30.2 million cubic feet per day.

In 1948 the well was shut in for lack of market for the gas. In 1950 the well was worked over, and an open flow was taken in January, 1951, using the same datum of 9740.

The following data were obtained: Flow rate 7.581 million, tubing head pressure 1735; flow rate 5.919, tubing head pressure 2159; flow rate 4.449, tubing head pressure 2460; flow rate 2.914, pressure 2679; shut-in pressure 2978. From these data we calculate an open flow potential of 11.8 million cubic feet per day with the slope of the back pressure curve $50\frac{1}{2}^{\circ}$.

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A pressure bomb was run to 9402 feet or 5382 feet sub-sea and the following data were obtained: Flow rate, 7.581 million cubic feet per day. Tubing head pressure, 1735. Bottom hole pressure, 2386. Flow rate, 5.919. Tubing head pressure 2159. Bottom hole pressure 2862. Flow rate, 4.449. Tubing head pressure, 2460. Bottom hole pressure, 3205. Flow rate 2.914. Tubing head pressure, 2679. Bottom hole pressure, 3473. Shut-in tubing head pressure, 2978. Bottom hole pressure, 3875.

From this data we calculate an absolute open flow at 11.3 million cubic feet per day, with a slope on the back pressure curve of 50 degrees. Using the Vitters method we calculate the open-flow potential to be 11.7 million cubic feet per day, with a slope on the back pressure curve of 51 degrees. The data are substantially in accordance. The well was worked over again in October, 1951, and a short flow test would indicate an open-flow potential of probably about 25 million cubic feet per day. This test shows the following readings: Flow rate, 6.8 million cubic feet per day. Tubing head pressure, 2150. Flow rate, 7½ million cubic feet per day. Tubing head pressure, 2000.

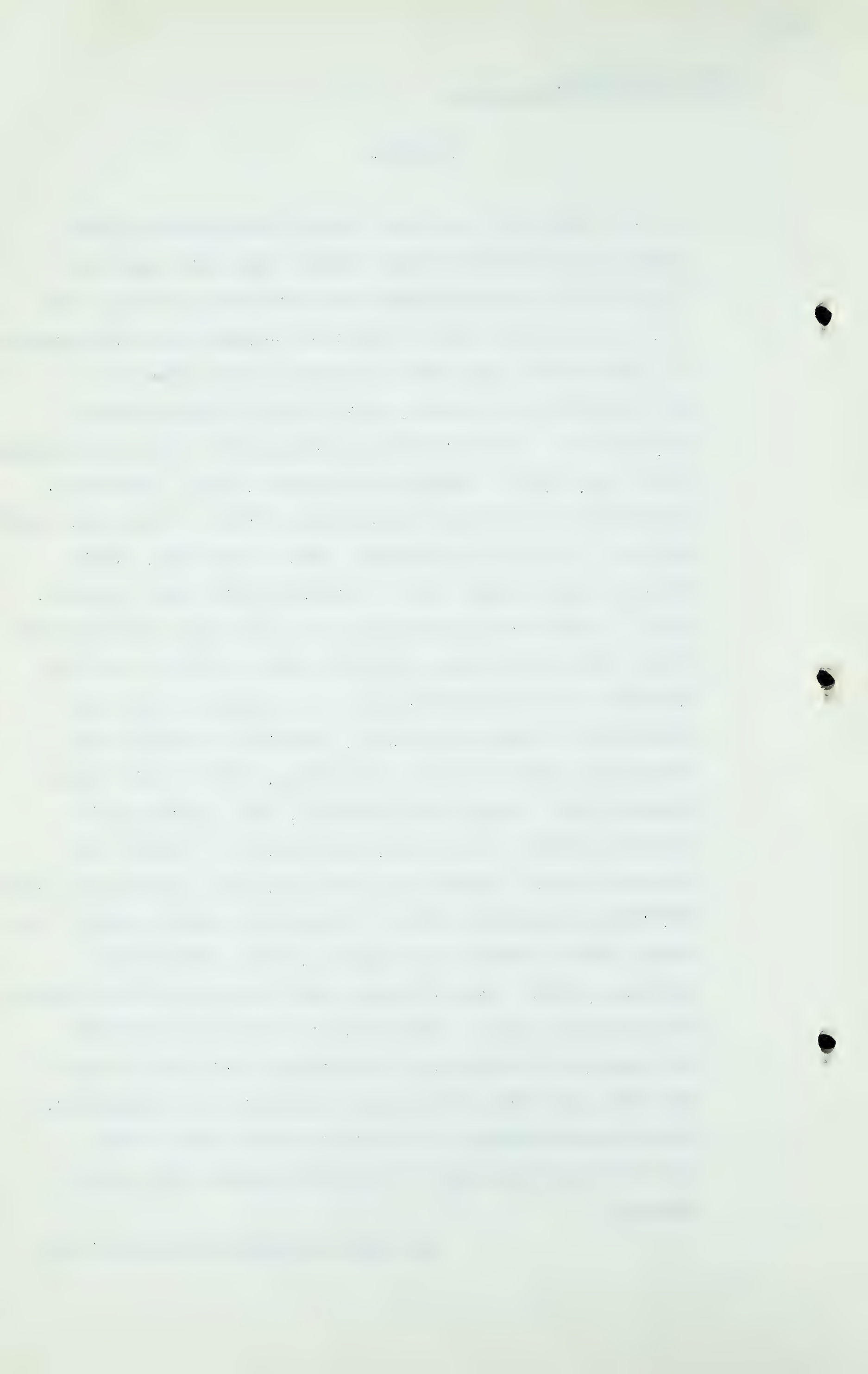
5-7-I was completed in November, 1947, and an open flow test was run in May, 1948, and using the datum depth of 10,035 feet. We obtained the following readings: Flow rate, 3.959 million cubic feet per day. Tubing head pressure, 2823. Flow rate, 6.368 million cubic feet per day. Tubing head pressure, 2708. Flow rate, 7.621 million cubic feet per day. Tubing head pressure, 2643. Flow rate, 10.25

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million cubic feet per day. Tubing head pressure, 2508. Shut-in tubing head pressure, 3005. From this data we calculate the absolute open flow of $37\frac{1}{2}$ million cubic feet per day, with the slope of the back pressure curve 43 degrees. In 1950 the well was worked over and an open flow test was again made in January, 1951, using the same datum of 10,035 feet. And this time we obtained the following reading: Flow rate, 7.398. Tubing head pressure, 2347. Flow rate, 6.022 million. Tubing head pressure, 2516. Flow rate, 4.588 million. Tubing head pressure, 2653. Flow rate, 3.007. Tubing head pressure, 2757. Shut-in tubing head pressure, 2953. From this data the absolute open flow of 22.6 million cubic feet per day was calculated, with a slope on the back pressure curve of $46\frac{1}{2}$ degrees. A pressure bomb was run to 9710 feet or 5610 feet sub-sea, and with the bomb we obtained the following data. Flow rate, 7.398 million cubic feet per day. Tubing head pressure, 2347. Bottom hole pressure, 3173. Flow rate, 6.022 million. Tubing head pressure, 2516. Bottom hole pressure, 3348. Flow rate, 4.588. Tubing head pressure, 2653. Bottom hole pressure, 3499. Flow rate, 3.007. Tubing head pressure, 2757. Bottom hole pressure, 3628. Shut-in tubing head pressure, 2953 and bottom hole pressure, 3911. From this information we calculate the open-flow potential of $20\frac{1}{2}$ million cubic feet per day and using the Vitter Method and the tubing-head pressures, an open-flow potential of 21.8 million cubic feet per day. In both cases the slope of the back pressure curve was 47 degrees.

The well was placed on production in

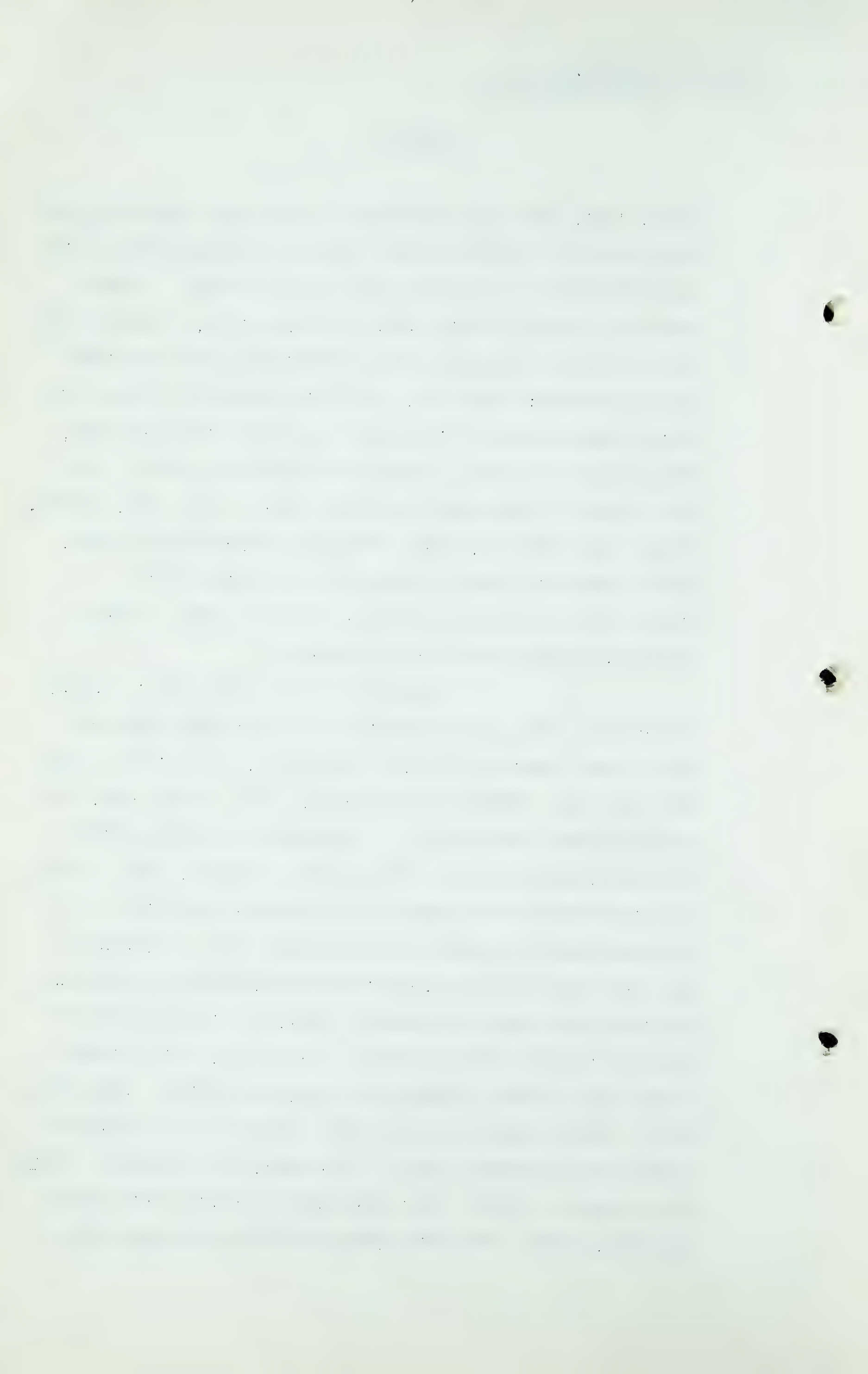


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April, 1951, and after producing for the past six months the well potential appears to have increased appreciably and is now estimated at 30 million cubic feet per day. A back-pressure test was run in 7-13-J in June, 1951, shortly after completion and using the datum of 9701 feet, the readings were as follows: Flow rate, 5.188 million cubic feet per day. Tubing head pressure, in pounds per square inch absolute, 2658, flow rate 7.259. Tubing head pressure, 2527. Flow rate, 8.247. Tubing head pressure, 2436. Flow rate, 10.285, Tubing head pressure, 2251. Shut-in tubing head pressure, 2940. From this data the open-flow potential of 35 million cubic feet per day was calculated, with a slope of the back-pressure curve of $43\frac{1}{2}$ degrees.

Short flow tests were made in 1-26-J in October, 1951, and we obtained the following readings. This is not stabilized flows. Flow rate, 6.31 million cubic feet per day. Tubing head pressure, 2300. Flow rate, 7.5 million cubic feet per day. Tubing head pressure, 2165. Flow rate, 9.05 million. Tubing head pressure, 2000. From this information we estimate the open-flow potential to be approximately 25 million cubic feet per day. In 10-6-I we also made some short non-stabilized flow tests on the completion of the well in November, 1951, and in this case we obtained the following readings. Flow rate, 8.55 million cubic feet per day. Tubing head pressure, 2650. Flow rate, 7.48. Tubing head pressure, 2660. Flow rate, 6.4 million. Tubing head pressure, 2725. Flow rate, 5.35 million. Tubing head pressure, 2775. And a three-hour shut-in tubing head pressure, 2900. From this data we estimate the open-flow



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potential to be approximately 45 million cubic feet per day.

MR. HENDRICKS: Please answer my learned friend's questions.

CROSS-EXAMINATION BY MR. NOLAN:

Q Mr. Broeke, there is one thing that I would like to ask you about, if I may, please. There has been mention made here of your contract with the Canadian Western Company. I do not want to go into the detail of that contract because it speaks for itself, but perhaps you can tell me how much gas you have now available for delivery over and above the requirements of that contract?

A Yes, I believe I can answer that question, Mr. Nolan. Our present contract requires -- or let us put it this way, our present contract is, I understand, 20 million cubic feet per day with an 80% load factor, So we are required to have a field potential of 20 million.

Q Of 20?

A 20 million cubic feet per day.

Q Yes?

A Adding up the calculated open-flow which I have given you in my data, we obtain a total field potential of 160 million cubic feet per day.

Q Yes, and put in simple language, how much is now available for delivery?

A Well, naturally, Mr. Nolan, that depends on what percentage you feel you might take of the calculated open-flow potential.

Q And it depends, I suppose, on the requirements of the Canadian Western Company. There are some provisions that they

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Cr. Ex. by Mr. Nolan.

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take as much as they require, are there? Or is there any ceiling on the amount that they are permitted to take?

A I am not aware that there is any ceiling, Mr. Nolan.

MR. HENDRICKS: I am afraid our witness is not too conversant with the terms of the contract. I do not know whether it would be proper, but I might be able to answer any questions on the terms of that contract.

MR. NOLAN: I do not want to inquire into the terms of the contract. I simply want to know whether there is any gas now available over and above the contractual requirements?

MR. HENDRICKS: I can say this, which might be helpful. At the present time we are only required to deliver under the present contract 20 million cubic feet per day.

MR. STEER: That contract, I think, is on file.

Q MR. NOLAN: Have you available for delivery more than 20 million cubic feet per day, Mr. Ten Broeke?

A Well, we have more available than 20 million cubic feet per day. Again, the total calculated field potential is approximately 160 million, and what percentage should we take? If we take 1/4, which is a reasonable figure to take, we would have approximately 40 million cubic feet per day available.

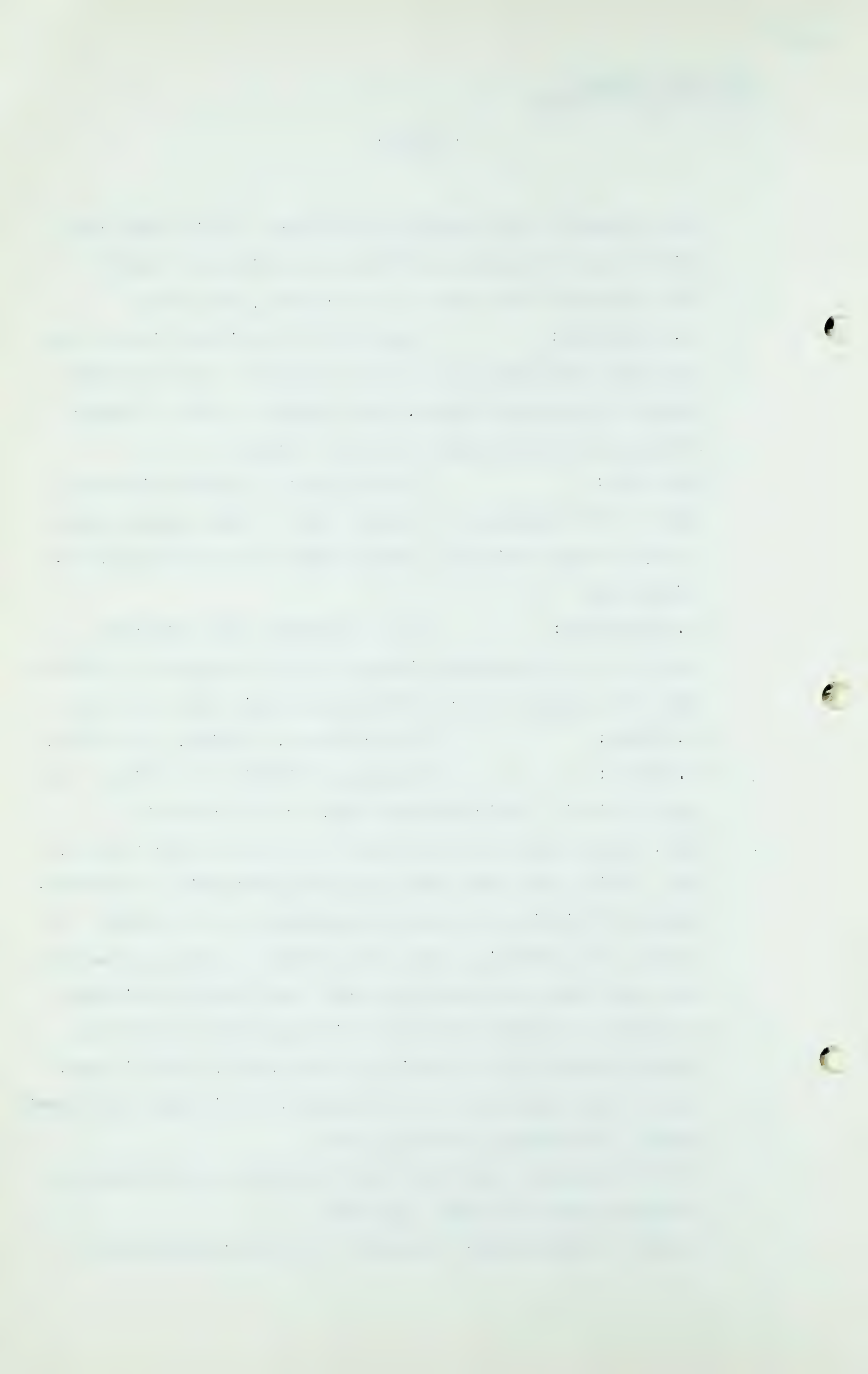
Q I suppose the amount you have available would depend to a certain extent on the capacity of your plant, would it not?

A Now, you are putting it in another way, aren't you, Mr. Nolan?

Q Perhaps I am putting it another way.

A You are asking me about the field potential and now you are asking me about the plant potential.

Q I want to know whether the amount you have available for



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delivery is governed by the field potential or the plant capacity. Does it depend on plant capacity?

A You mean the potential rate available in the well?

Q No, I mean available for delivery. After you have supplied the requirements of the Canadian Western have you any gas left available for anybody else?

A I do not know if I can answer the question. It would seem to me it is not as simple as that. We should not look only into the immediate requirements but into the future requirements of this company.

Q So if I asked you what gas you would have available for delivery over and above the Canadian Western requirements, say in two or three years' time?

A I simply could not answer you.

(Go to page 2866.)

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Exam. by Mr. C.E. Smith.

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Q MR. NOLAN: What is the capacity of the plant?

A 30 million cubic feet per day.

MR. C.E. SMITH: Mr. Steer, was that contract put in? I can not remember whether it was put in or not.

MR. STEER: I can not definitely say. I think it was. I think it was put in at a time when we were discussing it with Mr. Dixon. I have not a list of the exhibits here. In any event, it is available if required.

MR. MARTLAND: I have nothing, sir.

THE CHAIRMAN: Mr. McDonald, have you any questions?

MR. McDONALD: I have no questions.

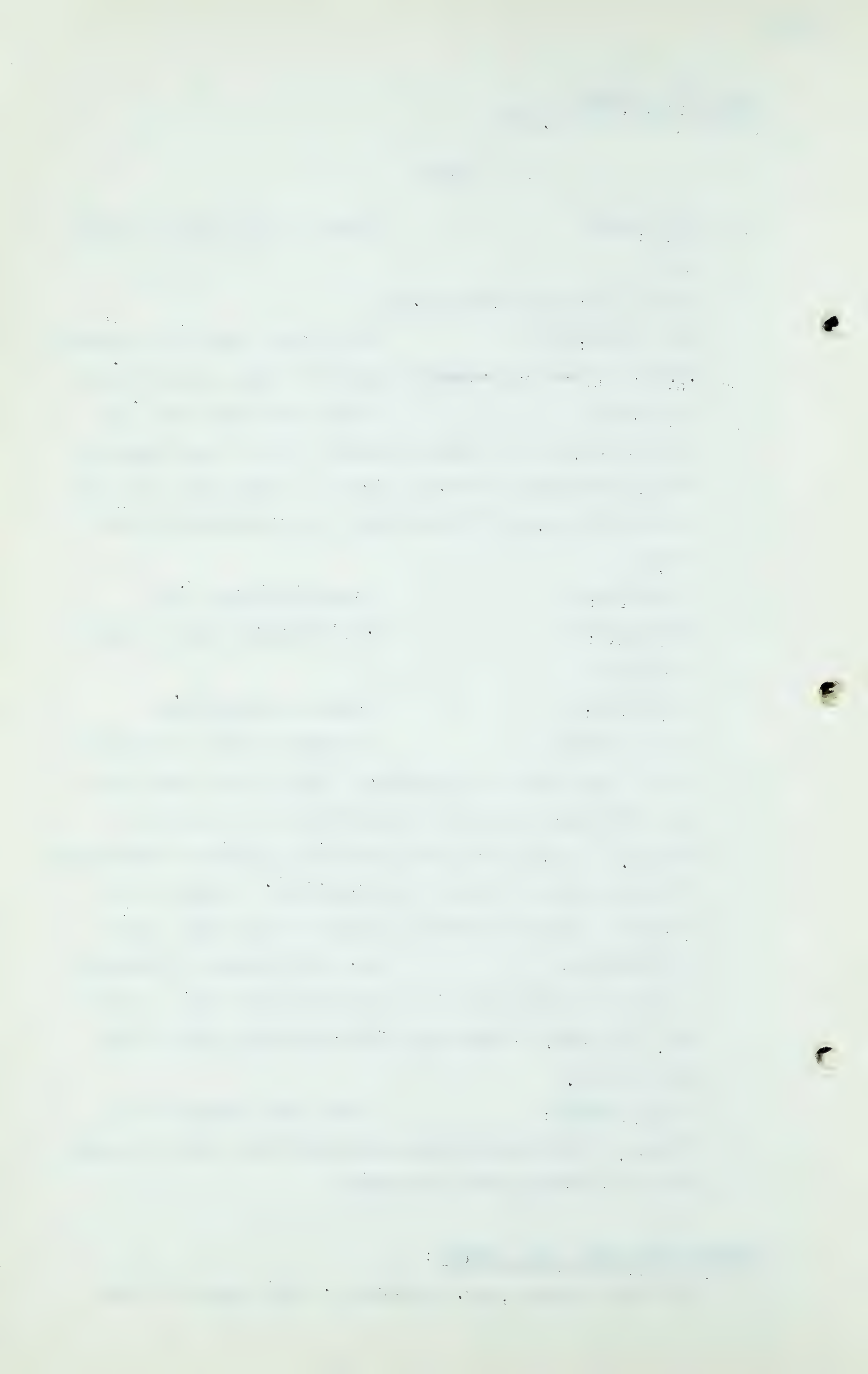
MR. C.E. SMITH: I wonder if Mr. Ten Broeke would be available on Wednesday. There is no submission here and nobody has had an opportunity to look at the material. I would like very much if my officers would have an opportunity to look at the transcript. Would it be possible? Would it disturb anybody to have that done?

MR. HENDRICKS: Mr. Ten Broeke is planning to leave town and the trip would take some time, several days, at least. I apologize for not having this in submission form.

MR. C.E. SMITH: I was not looking for an apology. I had hoped these gentlemen would have an opportunity of studying the transcript.

EXAMINATION BY MR. C.E. SMITH:

Q One or two things, Mr. Ten Broeke. With regard to what



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you term, I think, proven acreage, is that given as 2400?

A That is correct, sir. I believe I have stated that the proven productive area would cover approximately 2400 acres.

Q Would you care to explain how you arrived at that proven acreage, if that is the correct term?

A Well, sir, that is the acres that I consider to be proven on account of the completion of the five wells which we have drilled at 1-mile distances and that we have approximately a length of proven productive area of 5 miles and a width, I believe, of slightly less than 1 mile.

Q Proven acres of 2400 is the total of five wells, roughly?

A With a certain width there.

Q You are taking each well and giving a proven width to it and then totalling and it comes to 2400?

A Yes.

Q And you used the term "6,000 acres" for your probable productive acreage?

A That is an opinion, sir.

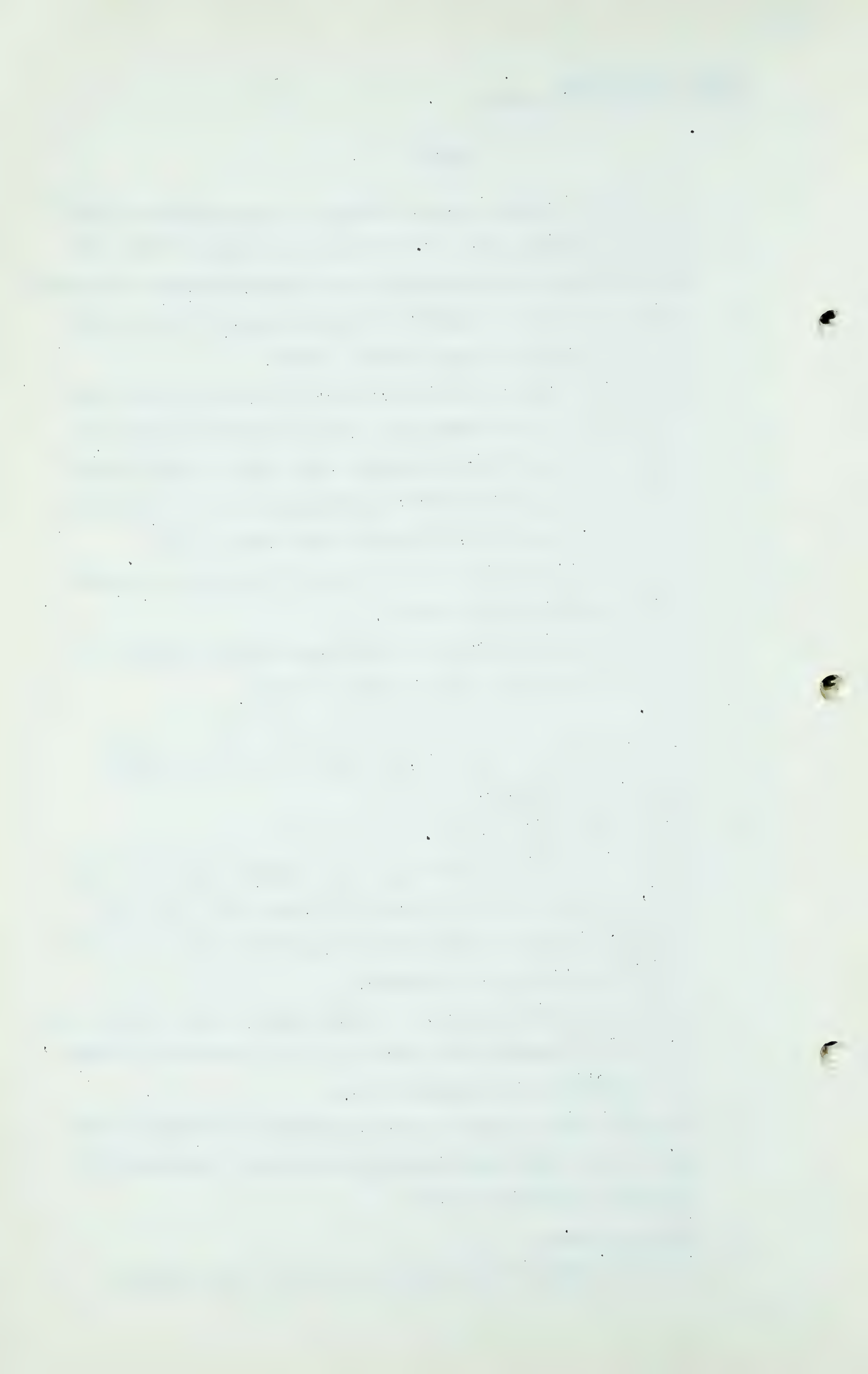
Q Would it be fair to say that your company takes the figure of 6,000 acres as the amount of acreage which you hope to produce, which you feel you will produce? Is that correct as far as acreage is concerned?

A That is probably correct. I would rather state it this way, that at the present time that is my best estimate of what the productive area should cover.

Q Probably that is just as good an answer as anybody could get. It is your best estimate of what you consider the probable productive area?

A That is right.

Q It is the figure with regard to area that the company



Henry Ten Broeke,
Exam. by Mr. C.E. Smith.

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presently places their development on, is that correct?

A That is right.

Q And I think you also said maybe what you termed a speculative area?

A Well, I did not exactly say that, speculative area, I said anything larger than that would be speculative.

Q At the time there is speculative?

A Well, sir, that depends on what you term speculative, I don't know.

Q That is the word you used, I did not use it. Maybe you would like "possible", we have heard a lot about that.

A However, I do agree with you that there is naturally the possibility exists that the area should be larger.

Q One other thing, where, in your test, do you arrive at 5 per cent or less porosity but you have a permeability of more than 1 millidarcy, was any consideration given as to whether or not it might be productive? Are you a doctor, Mr. Ten Broeke, or not?

A No.

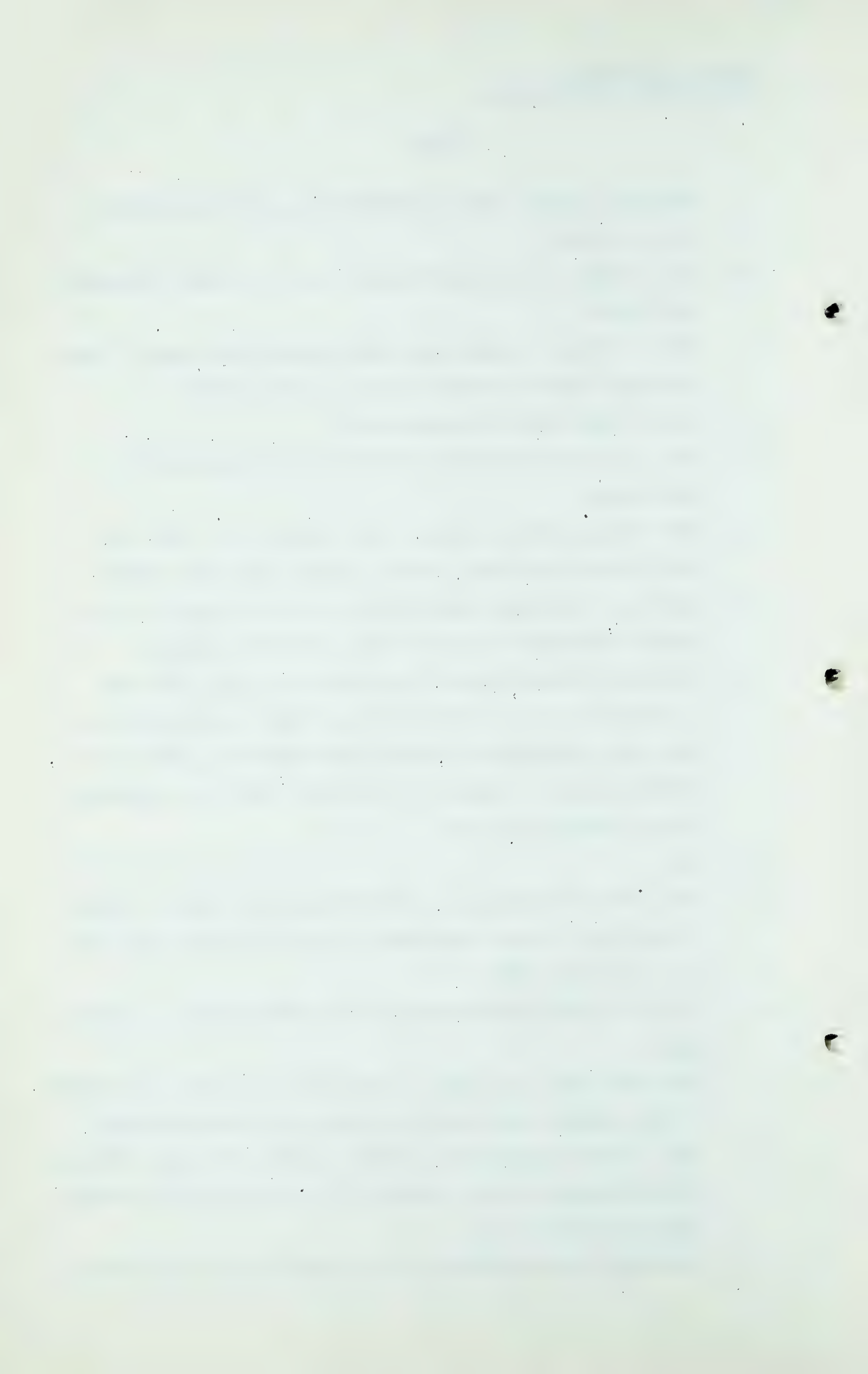
Q Well, Mr. Ten Broeke, you understand what I mean? I think you said you did not consider it where there was less than 5 per cent porosity?

A I put it on two base levels, 5 per cent porosity, 1 millidarcy.

Q Where you have 5 per cent or less and more than 1 millidarcy do you consider that should be taken into consideration?

A Well, I don't know, sir. We have cut it off there. Whether that is correct or not correct, it is our opinion as being the best way to do it.

Q Arriving at your estimate you decided to cut it off there,



Henry Ten Broeke,
Exam. by Mr. C.E. Smith.

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in any event?

A Yes. I think it depends on the type of field you are dealing with. If you have a field where the formation is fractured and shattered I think you could take your base levels lower than that.

Q Having knowledge of this field at the time that situation might occur?

A It might, but we don't think so.

Q You do not think so at the present moment?

A That is right.

Q And you prefer to use the base you have described?

A That is right.

Q One other thing. Take your well 4-24-J as an example, Mr. Ten Broeke, according to the notes of Mr. Hardy in 1948 you arrive at an open flow of 30.2 million, in 1951 11.8 million, and then later in 1951, 25 million. I wonder could you expand a bit on the difference between those figures?

A You say in 1948?

Q 30.2, is that correct?

A That is right. That is the initial, I believe. Then the wells killed and apparently mudded off and then the next test we got was appreciably less.

Q Yes, you dropped to 11.8 million.

A Then we worked the well over again in order to restore its capacity, re-acidized it and cleaned it out in an attempt to get it back to its old potential, and then we got this figure of approximately, I believe, 25 million. So apparently we have done some good in this worked-over job.

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Exam. by Dr. Govier.

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Q I think that is true with respect --

A To 5-7-I also.

Q From your original of 37.5 you get it back to 22.6?

A It went to 22.6 and by simply producing apparently the well is cleaning itself and it is coming up. That well is not worked over yet.

Q It is your idea that the well is cleaning itself, it probably may come back better yet?

A It should come back or may come back to its old potential.

Q Have you anything else to add on that particular angle of this discussion?

A No, sir.

Q I just want to make sure that your 576 billion -- that was your estimate of producible, is that right?

A Of producible, that is right. And marketable reserves would be 80 per cent of that.

Q 80 per cent is your marketable?

A 80 per cent of producible would be the marketable, and the in place is slightly higher.

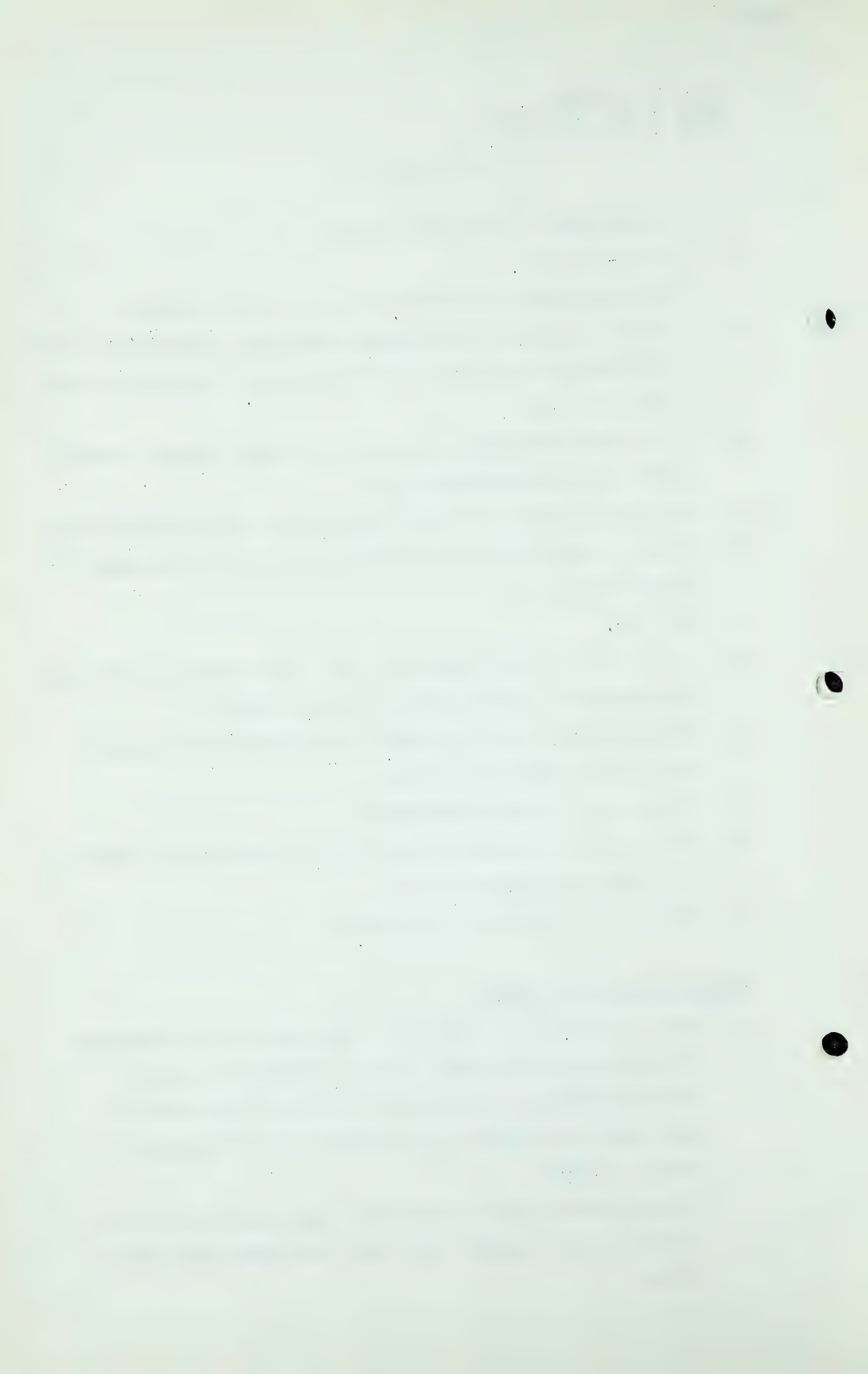
Q That is all I have at the moment.

EXAMINATION BY DR. GOVIER:

Q Mr. Ten Broeke, I wonder if I might ask a few questions. You explained to us that you had excluded the porous section showing a porosity of less than 5 per cent or less than 1 millidarcy in or at the net pay thickness?

A Net pay interval.

Q I just wanted to ask if that exclusion was done on the basis that you thought that small pore space was water-filled?



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A No, sir.

Q Could you give us some indication of your reasons for that?

A The reasons, as we felt there was that low permeability and it probably would not contribute to the production, I do agree with you that it is quite well possible that when you do get to the 1 or 2 per cent porosity figure the connate water content may be appreciably higher.

Q But your reason for excluding this was primarily because of the low permeability?

A The low permeability, that is right.

Q You make reference to connate water determinations, Mr. Ten Broeke. If I heard you correctly, you said they were electrical determinations?

A That is right, and done by our logging experts from electrical surveys.

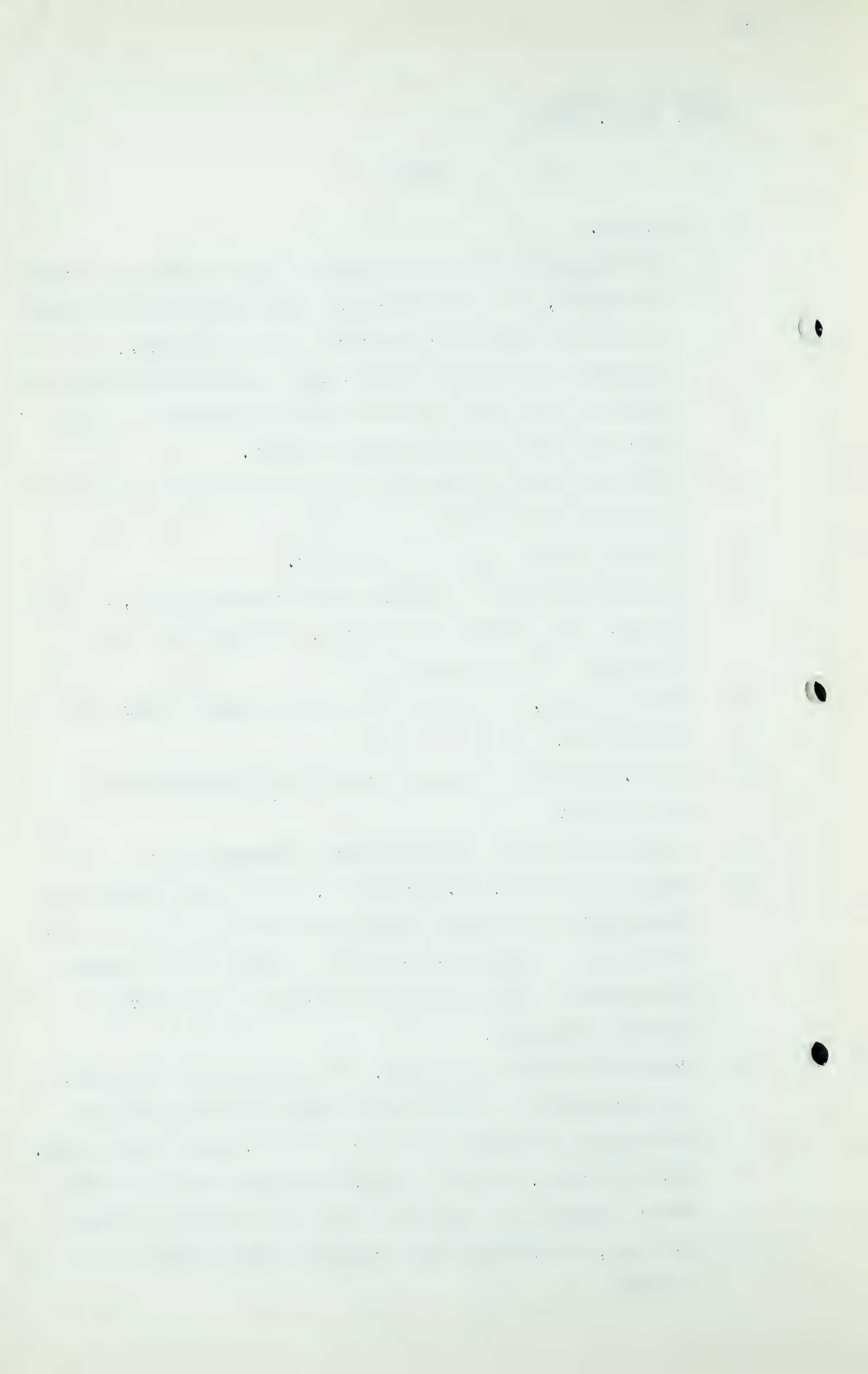
Q I see. Did you have any restored state determinations carried out?

A I have no reliable restored state information yet.

Q Could you tell me, Mr. Ten Broeke, if the recent wells you have drilled have given you more confidence or less confidence in the seismic picture which you have of the Jumping Pound field? Have they tended to confirm your previous ideas or otherwise?

A That is a difficult question. I would say that in general the development of the field has been such there that we could have reasonable confidence in our seismic information.

Q Mr. Ten Broeke, did you, or have you calculated any volumetric average pay thickness? As I understood the figure 147 feet, it represents an arithmetic calculation of the 5 wells?



Henry Ten Broeke,
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A That is right, sir.

Q Have you attempted to arrive at an average thickness on the basis of volumetric?

A No. When I do talk about 2400 acres I mean net acres. I discounted that for wedge-out against the water table and also for dips. That is what you have in mind, no doubt?

Q Is that statement also applicable to the 6,000 acre estimate?

A Yes. That is naturally more difficult to do but that was intended.

Q Does it also apply to the average porosity? That is, you gave us a figure of 7.9 per cent average porosity, which I take it is an arithmetic average of those 5 wells.

A Of the 5 weighted averages, that is right. In other words, what we have done is correcting for wedge-out and dips and correcting for pay intervals but not for porosity.

Q You made no attempts to contour porosity or anything like that?

A We have not used that refinement yet, no.

Q I suppose there is not enough information yet, is there?

A That is right.

Q I was wondering, also, whether you had made any attempt to correlate the open flow data which you have obtained with the permeability data you have obtained and whether they indicate the same order of magnitude?

A We have not attempted that yet.

Q All things considered, Mr. Ten Broeke, what would your best estimate be of the average open flow obtained on the wells -- I am sorry, let me put it in another way. All things considered, what would be your best estimate of the

Henry Ten Broeke,
Exam. by Dr. Govier.

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absolute open flow for an average Jumping Pound well?

A I would say approximately 30 million cubic feet absolute open flow.

Q And what, in your experience, would be a reasonable percentage of that figure for a normal operation?

A We have produced our wells at 40 per cent of the calculated open flow and apparently we can produce them that way. I do not, Dr. Govier, that is a question that is hard to answer yet. I think 25 per cent is definitely conservative, it is a good figure. You might go higher than that.

I believe, but I am giving more opinion than something I can prove, that 30 and 40 per cent could well be done.

Q Would you consider that as a ceiling even on peak days?

A No. I think in peak days you could go to 40 or maybe slightly higher.

Q Let me see if I have interpreted you correctly, Mr. Ten Broeke. Is your feeling that for average operations 25 per cent is probably conservative and you might well go to 30 and up to 40?

A Yes, sir.

Q And on peak days you would not hesitate at all to go as high as 40?

A That is right, sir.

Q I do not know whether you heard the evidence, Mr. Ten Broeke, but earlier in these proceedings the idea was suggested that as fields declined and as reservoir pressure declined it might well be in order to increase the percentage of absolute open flow at which wells were permitted to operate with the thought that that would tend to maintain the sand face differential at a higher level and at a level

Henry Ten Broeke,
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more approaching its initial level. I wondered if we could have the benefit of your experience on that proposition.

A You mean, I think, it would be all right or a good thing to do this?

Q Yes.

A I believe so.

Q Do you believe it is sound to assume that any reservoir damage which might take place would be almost entirely dependent on the sand face differential?

A I do not know if I could have an opinion on that.

Q But you would not be fearful of seeing the percent of absolute open flow increased, say, to 50 per cent?

A Later in the life, that is right.

Q Those are all my questions. Thanks, Mr. Ten Broeke.

CROSS-EXAMINATION BY MR. MILVAIN:

Q I wonder might I ask one question, if you do not mind. Mr. Ten Broeke, in answer to my friend, Mr. Nolan, you told him that the plant capacity was 30 million cubic feet per day?

A Yes, sir.

Q I wonder if there should be some deduction from that for fuel and other plant loss?

A The 30 million cubic feet per day is raw gas intake.

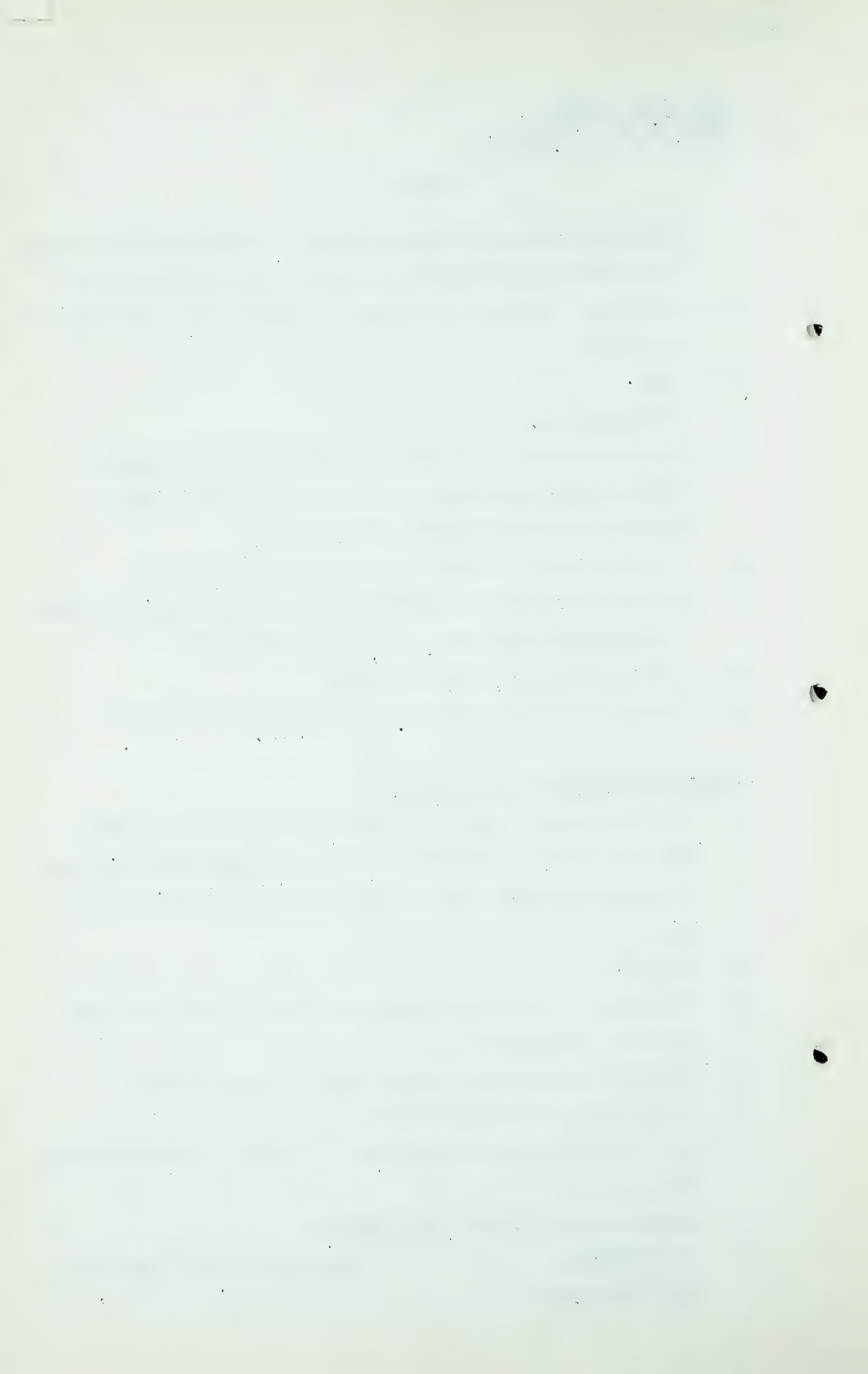
Q What would the deduction be?

A It is approximately 20 per cent. I think I have given the figures.

Q Approximately 20 per cent, thank you.

THE CHAIRMAN:
Mr. Ten Broeke.

That will be all, thank you,



Allan H. Williamson,
Dir. Ex. by Mr. Martland.

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MR. MARTLAND: Mr. Chairman, I propose to call first Mr. Allan Williamson who will be making a short policy statement. I have some copies of the text here which he is reading, which can be distributed.

SUBMISSION OF MR. A.H.
WILLIAMSON PUT IN AND
MARKED EXHIBIT No. 103.

ALLAN HOLMES WILLIAMSON,

having been first duly sworn, examined by Mr. Martland, testified as follows:

Q MR. WILLIAMSON, you are a director of Western Pipe Lines?

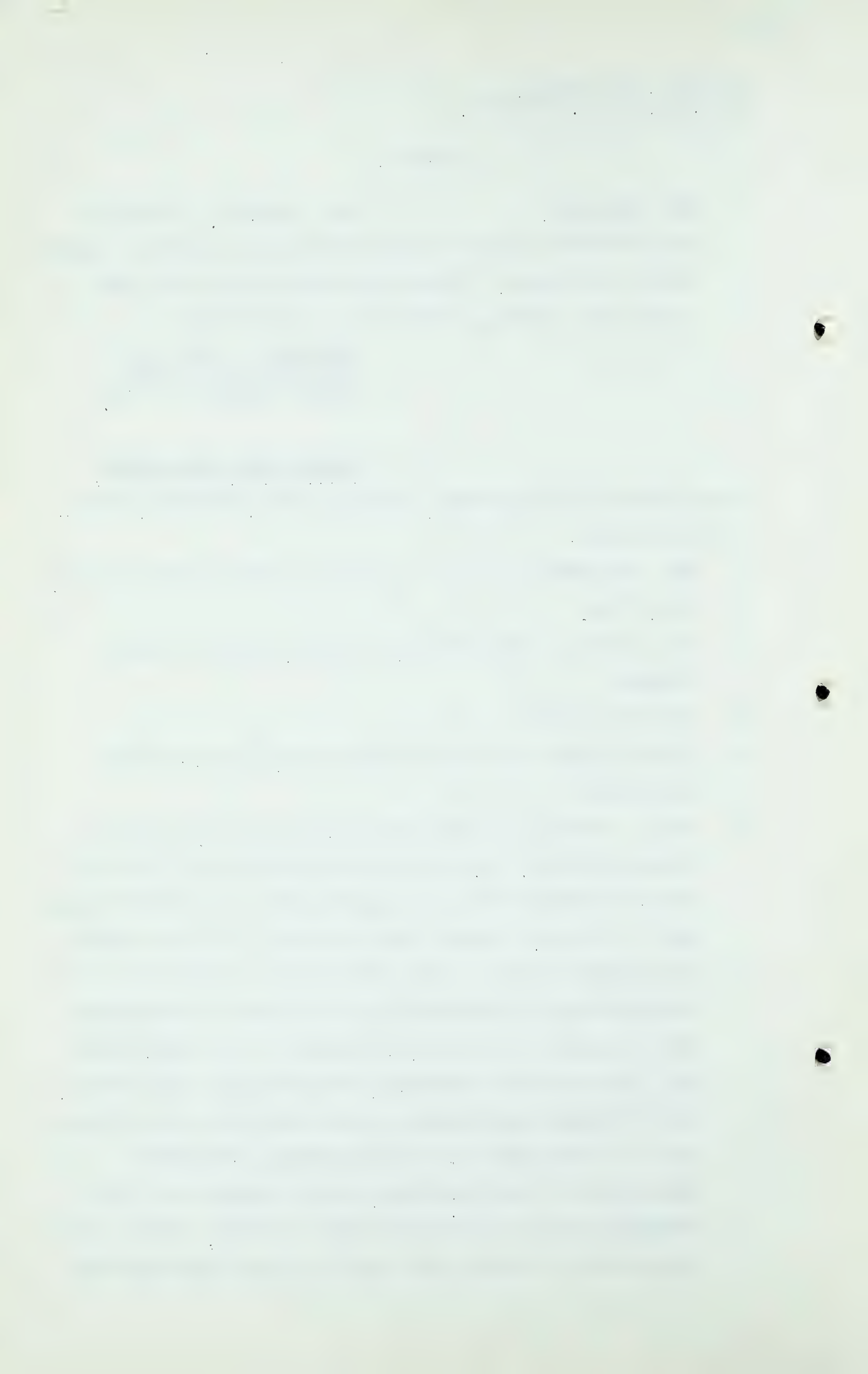
A Yes, I am.

Q And you are a vice president of Wood, Gundy & Company Limited?

A That is correct.

Q Would you mind telling the Board briefly your business experience?

A Well, I am vice president and director of Wood, Gundy & Company Limited. We are an investment banking firm operating in offices throughout Canada and in the United States and in Britain. We consider ourselves one of the outstanding banking houses in this country and we specialize in the underwriting and distribution of the bonds of Governments and Municipalities, more particularly in the underwriting and distribution of industrial securities for the development of Canada particularly, which securities are sold not only in Canada but in the United States. My entire experience has been with Wood, Gundy & Company with the exception of four years that I was in Ottawa, first at the Controller of Supplies and later as Rubber Controller and



Allan H. Williamson,
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Timber Controller for the Dominion Government. I do not intend to imply that by any of this background material that I have any particular qualifications in connection with the gas industry, because I have not.

Q And you have prepared, Mr. Williamson, a policy statement for Western Pipe Lines?

A Yes, sir.

(Go to page 2277)

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Dir. Ex. by Mr. Martland

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Q MR.MARTLAND: Would you mind reading that now,
Mr. Williamson?

A Mr.Chairman, I represent Western Pipe Lines which was
incorporated by a special Act of Parliament on the 30th
of April, 1949, and I am substituting for Colonel L. D. M.
Baxter, who is the President of our Company, and who is
unable to be here today due to ill health.

Colonel Baxter has asked me to
express his regret to the Board at his inability to appear,
and also to express his regret to his many friends who
are interested in the Gas Hearings. I am sure the Board,
as well as those present who know Colonel Baxter, will join
with me in expressing the hope that he may soon be fully
restored to health.

Colonel Baxter, as you know, has
been associated for many years with the development of the
oil and gas industry in Western Canada, and he is the
President of C. & E. Corporation; of Oslér, Hammond and
Nanton Ltd., and of Anglo Canadian Oils of Brandon, Manitoba,
as well as a director of Home Oil; of International
Utilities and of Anglo Canadian Oil Co. Ltd., Calgary.

Although this is not in the statement,
I might add that I have just included his oil interests.
He is, of course, a director of other types of corporations
in Canada.

Western Pipe Lines was the first
Company to apply for incorporation as an interprovincial
pipe line company and we have faithfully adhered to our
original objective of bringing gas to the people of Manitoba
and Saskatchewan. At this stage I would like to summarize

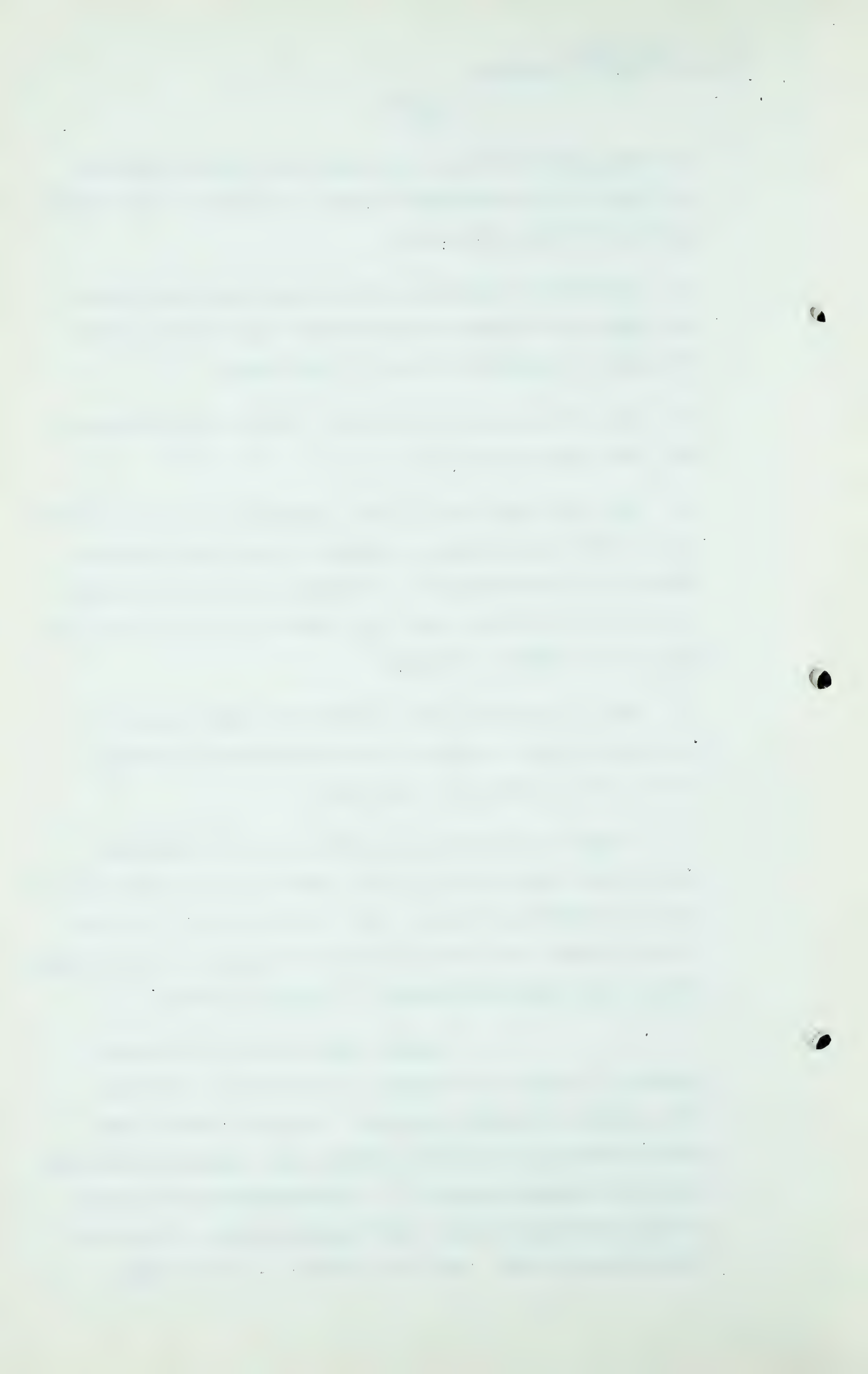
A. H. Williamson,
Dir. Ex. by Mr. Martland

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our objectives which are to supply the Western Prairies with gas by our arrangement which; we believe, will accomplish all of the following:

1. Take from Alberta an amount of gas which will only be surplus to the present and future requirements of the Province of Alberta as fixed by this Board.
2. Pay the sellers of this gas a price as favourable as any other system can pay.
3. Take this gas from Southern Alberta so that the Pacific Coast market will remain available for gas from Northern Alberta thus providing for a Canadian route to Vancouver, which is in accordance with the expressed desire of my home Province of British Columbia.
4. Enable the development of Northern Alberta and of Northern British Columbia to proceed instead of denying those areas a market for their gas.
5. Deliver gas from Southern Alberta to the Canadian Prairies who need it most, which areas will go without gas if Southern Alberta gas goes to the Pacific Coast. As previously stated, the latter area can be supplied from Northern Alberta with great advantages to Northern Alberta.

Western Pipe Lines is a Canadian Company. It has been financed to date by my own firm, Wood, Gundy and Company Limited; by Osler, Hammond and Nanton Limited; by Nesbitt, Thomson and Company Limited, all strictly Canadian Companies; by International Utilities, an American Company about 38% Canadian-owned, - I wish to change that to 30%; that is a mistake, - and by Anglo



A. H. Williamson,
Dir. Ex. by Mr. Martland

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Canadian Oil Company and C. & E. Corporation, both local Companies that have contributed to the development of Alberta for many years and not just since the discoveries at Leduc.

It is our contention that the backers of Western Pipe Lines, mentioned above, provide:

(a) Experienced financial support and judgment through the financial firms of Osler, Hammond and Nanton Limited; Nesbitt, Thomson and Company Limited, and my own firm.

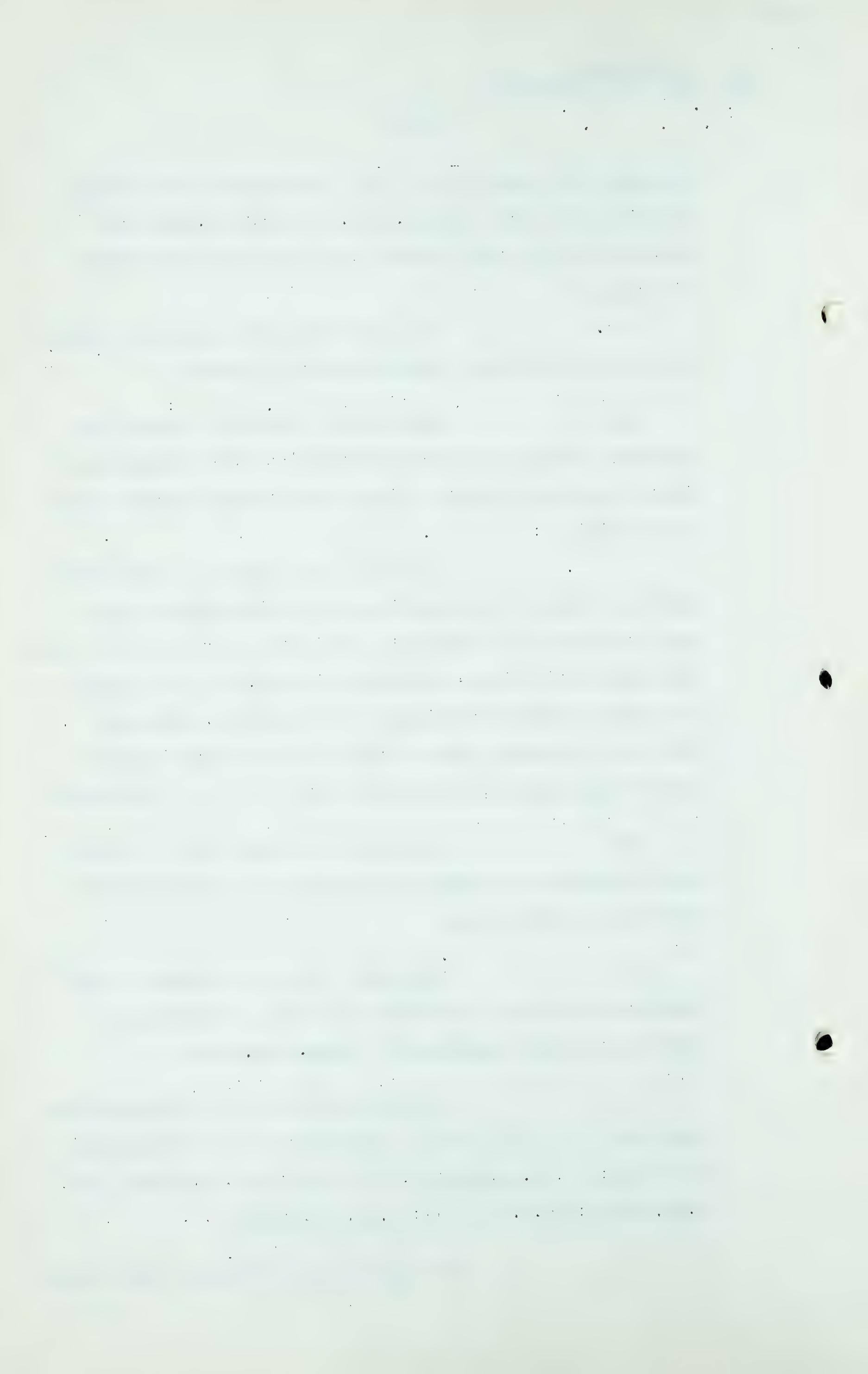
My firm is experienced in financing Canadian Industry in general and oil transportation and gas distribution in Canada in particular. The other two firms associated with us are similarly experienced. For example, we acted as syndicate managers for the Interprovincial Pipe Line financing, and we will act in the same capacity in the financing of the proposed oil pipe line to Vancouver.

(b) Knowledge of the problem of natural gas distribution through the experience of International Utilities in this field.

(c) Knowledge of the development of gas supplies through the experience of C. & E. Corporation Limited and Anglo Canadian Oil Company Limited.

The present Directors of Western Pipe Lines are: L. D. M. Baxter, President; A. H. Williamson; E. G. Smith; K.W.Campbell; G. P. Osler and E.A.Nanton, all Canadians and all but one Western Canadians.

The application of Western Pipe Lines



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Dir. Ex. by Mr. Martland

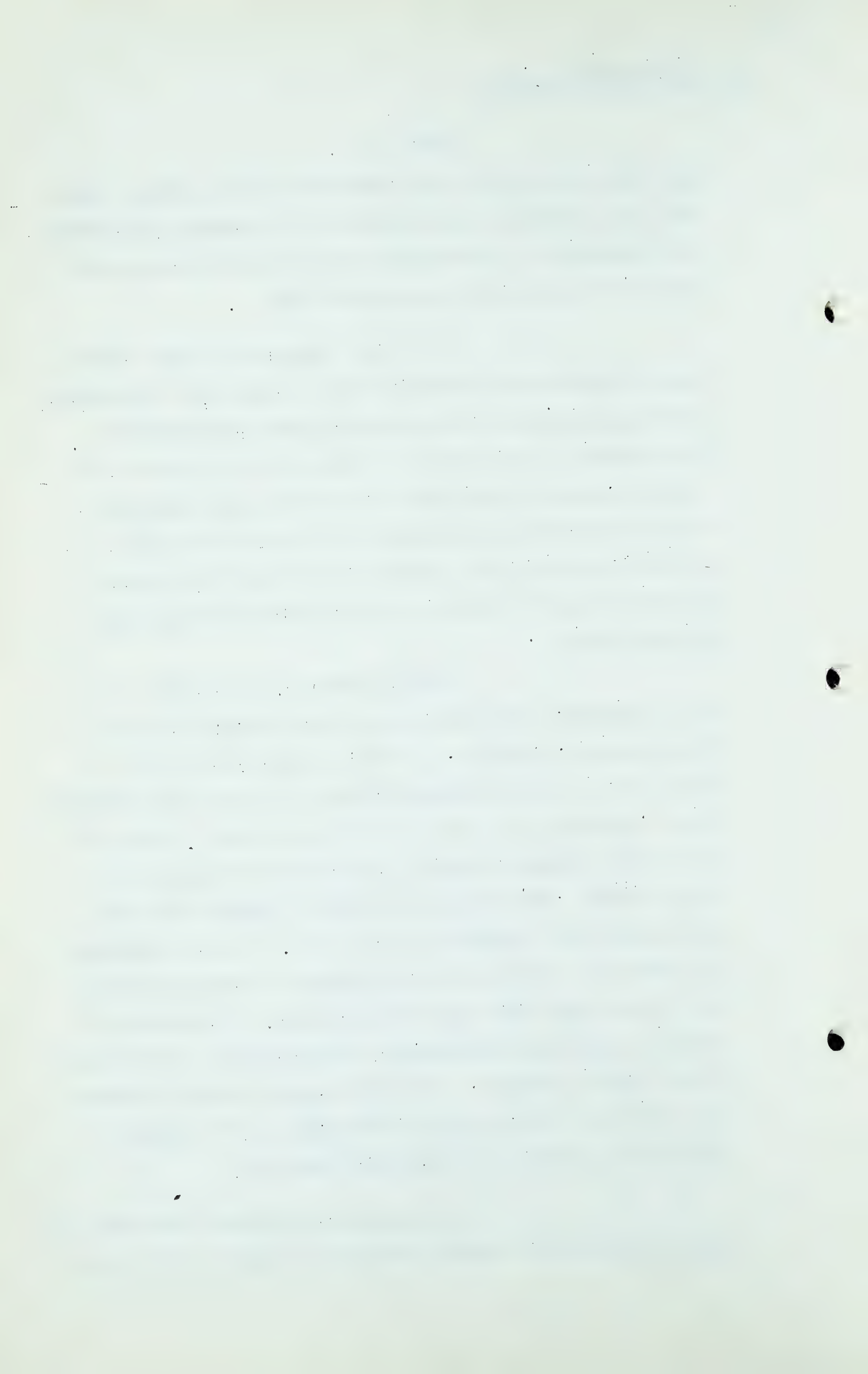
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now being presented to this Board has as its primary objective the supplying of natural gas to all communities within the Provinces of Saskatchewan and Manitoba within economic reach of its proposed transmission line.

It is the contention of this Company that the exportable surplus of natural gas, after providing for Alberta's present and projected future requirements, should first be used for the benefit of the adjacent Provinces, having in mind that the resulting improvement in the economy of Western Canada will raise the standard of living, and lead to the extension of industry throughout this area so as to provide a more balanced economy than at present exists.

Colonel Baxter, the President of this Company, has frequently stated the guiding policy of this project, - namely, to provide natural gas for the people of the Western Canadian Prairies at the lowest possible rates. Natural gas is the best fuel available. People of the Western Canadian Prairies, because of the rigours of their climate, are of all the people in Canada those who most require the benefits of this fuel. Alberta natural gas is needed most urgently in those parts of Canada where the fuel demands per capita are the greatest. A comparison of relative degree days effectively illustrates the greater need of the Prairie markets. The five-year average of degree-day deficiency 1945-50 shows in Winnipeg 11,039 compared with 7,732 in Toronto and 5,118 in Vancouver.

I can speak with personal experience to back my observations on this subject as I spent twelve very



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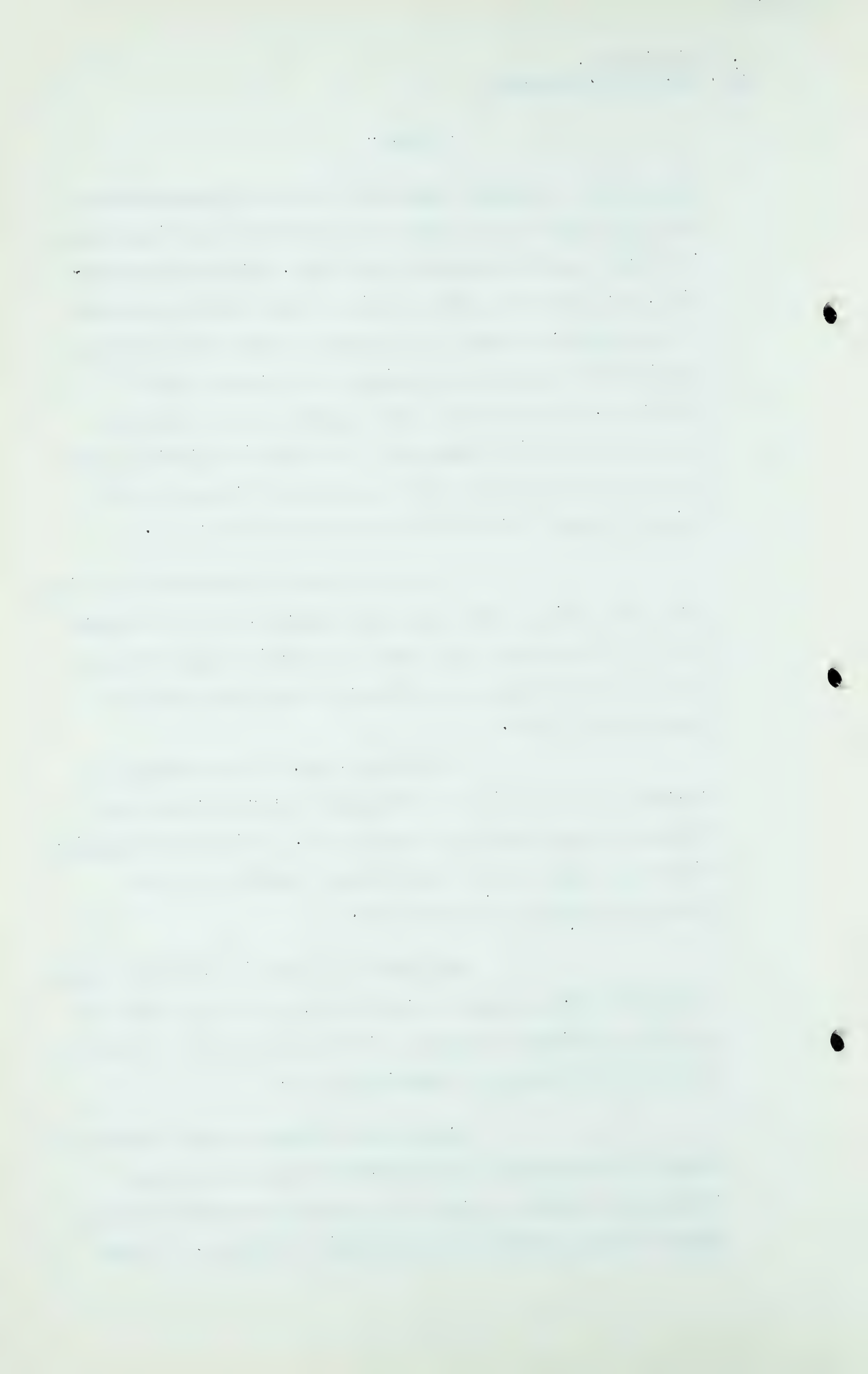
happy years in Winnipeg and have lived in Vancouver for the last twelve years (with the exception of my four years in Ottawa) and I can assure the Board, without qualification, that from the point of view of the comfort and need of the population that gas should go to my former home in Winnipeg in preference to going to my present home in Vancouver, and to my mind any argument on this point is removed when it is remembered that there is nothing in our application that will deny the people of Vancouver and British Columbia an adequate supply of natural gas.

It is the belief of Western Pipe Lines that the evidence which has been adduced before this Board now has established that there is sufficient gas available above the requirements of Alberta to meet the needs of Western Pipe Lines.

Believing this, we are prepared to concede the prior right of Canadian Western Natural Gas Company to draw gas from those fields, or from its transmission line connected to those fields, insofar as other sources of supply are inadequate.

Western Pipe Lines is prepared to give such undertaking as may be required by the Board under the previous paragraph in order to achieve the intent of Section 9 of the Gas Resources Preservation Act.

In the view of Western Pipe Lines the Board is fortunately not compelled to make a selection between the export of gas to the Pacific Northwest and the export of gas eastward to the Prairie Provinces. The gas



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reserves in the northwest of the Province which are not required for provincial needs are a logical source of supply for British Columbia and the Pacific Northwest area, making it possible to provide an all-Canadian route to the Canadian portion of that market. The export of gas to that market from the fields in the south of the Province would deny a market to the producers in the Peace River area who have expended large sums of money in their search for gas. On the other hand, export to the Pacific Northwest area from the Peace River fields would not preclude Pincher Creek and other large southern fields from obtaining an immediate market since the Western Pipe Lines project offers a satisfactory outlet for their gas now.

As in the case of the Pacific Northwest market, so in the case of Western Pipe Lines, the operation of a long-distance pipe line at maximum efficiency requires the addition to the Canadian market of an American market. For this reason Western Pipe Lines has entered into a contract with Northern Natural Gas Company to sell gas to that company at the Canadian border. That contract is herewith submitted to this Board.

MR. MARTLAND: I wonder, sir, if that might be marked at that point? It has been distributed and there will be available additional copies. I am tendering a copy of it now.

THE CHAIRMAN: Exhibit 104.

CONTRACT BETWEEN WESTERN PIPE LINES
AND NORTHERN NATURAL GAS COMPANY,
DATED OCTOBER 22nd, 1951, MARKED
EXHIBIT 104.

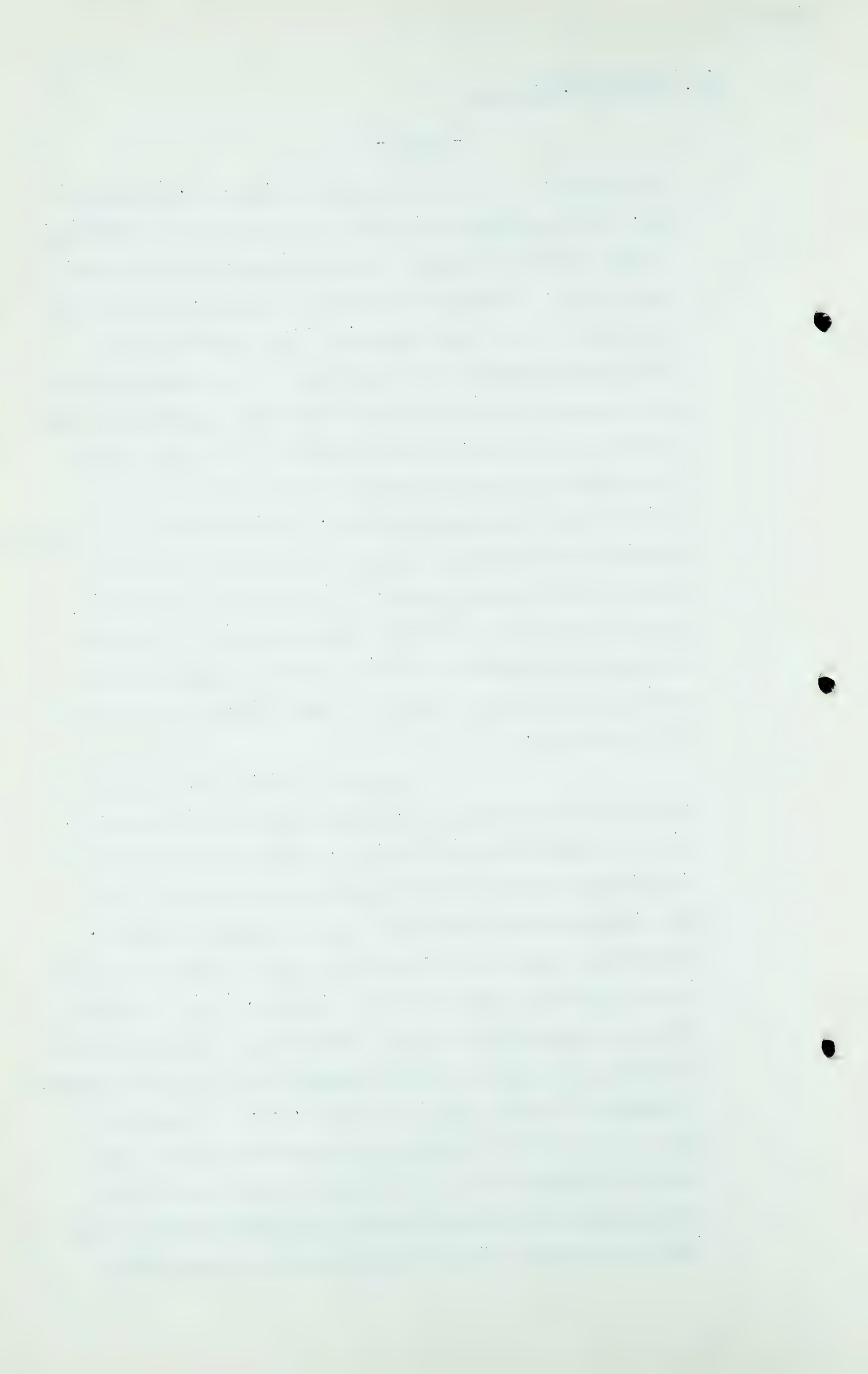
A. H. Williamson,
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Q MR.MARTLAND: Would you proceed, Mr.Williamson?

A Yes. This agreement has the great advantage of offering a very satisfactory market for gas immediately at a high load factor. Northern Natural Gas Company, with a long experience as an operating pipe line company in the Middle Western States, can purchase at once quantities of gas necessary to give Western Pipe Lines' operations their greatest efficiency. Representatives of Northern Natural Gas Company will give evidence to this Board as to the market which they make available. As the markets of Northern Natural Gas Company are already connected to sources of supply in the United States, it is possible to protect Canadian consumers of Western Pipe Lines in the event of emergencies reducing Western's sources of supply by providing an alternative means of supply during the course of such emergency.

The route traversed by the proposed pipe line of this Company is excellent pipe line country, with no engineering difficulties, and therefore can be constructed at less cost per mile than the lines of the other applicants who propose to serve Canadian markets. If our view that the all-Canadian route to Eastern Canada is not practical turns out to be correct, it is the view of this Company that the most satisfactory method ultimately to supply the Eastern Canadian market would be by an exchange arrangement between Canada and the U.S.A. A supply of gas to the Pacific Northwest from Northern Alberta and British Columbia and to the Middle Western States from Southern Alberta through Saskatchewan and Manitoba by pipe lines thus first serving Canadian markets would form a



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good quid pro quo for the supply of American gas to Eastern Canada.

As an alternative, Western could extend its line to, or supply others wishing to supply Eastern Canada if such a project could ever be demonstrated as economically possible and this Board ruled gas in sufficiently large quantities was available.

Briefly, Mr. Chairman, to summarize the position of Western Pipe Lines, it is that:

1. It is a Canadian project which would supply the most deserving Canadian market.
2. That market can be served without denying gas to the Pacific Northwest.
3. It is the most economically feasible route of any submitted by the applicants seeking to supply Canadian markets.
4. It offers a "ready-made" American market immediately at a high load factor.
5. It offers the greatest protection to the Canadian consumers.
6. It can pay sellers of gas as good a price as any other projects.
7. Coupled with the proposed export line through British Columbia to the Pacific Northwest, it offers a basis for an exchange agreement with the United States for the possible ultimate

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supply of gas to Eastern Canada.

The foregoing, Mr. Chairman, is an attempt in the briefest possible language, to outline the contention and the beliefs of Western Pipe Lines. We have numerous gentlemen ready to appear as witnesses who are highly qualified in their respective fields, which I am not, and who will be able to answer, I hope, to the satisfaction of this Board, any questions which arise as a result of this submission.

MR. C. E. SMITH: Would this be a convenient time to fall out for a smoke, in view of the new hours, sir?

THE CHAIRMAN: Yes, we will adjourn for a few minutes.

(Hearing resumed after short adjournment).

.....

(Go to page 2886)

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MR. MARTLAND: That completes the direct, sir.

CROSS-EXAMINATION BY MR. NOLAN:

MR. NOLAN: You will appreciate my difficulty in cross-examining on a document which was only presented to me about ten minutes ago. Four of us have been trying to read one copy during the interval while the Board was not sitting. I had hoped we would have come to the stage where we would have these documents given to us at least half an hour in advance of their presentation.

Q Mr. Williamson, I observe on page 1 of exhibit 103, at the very foot . . .

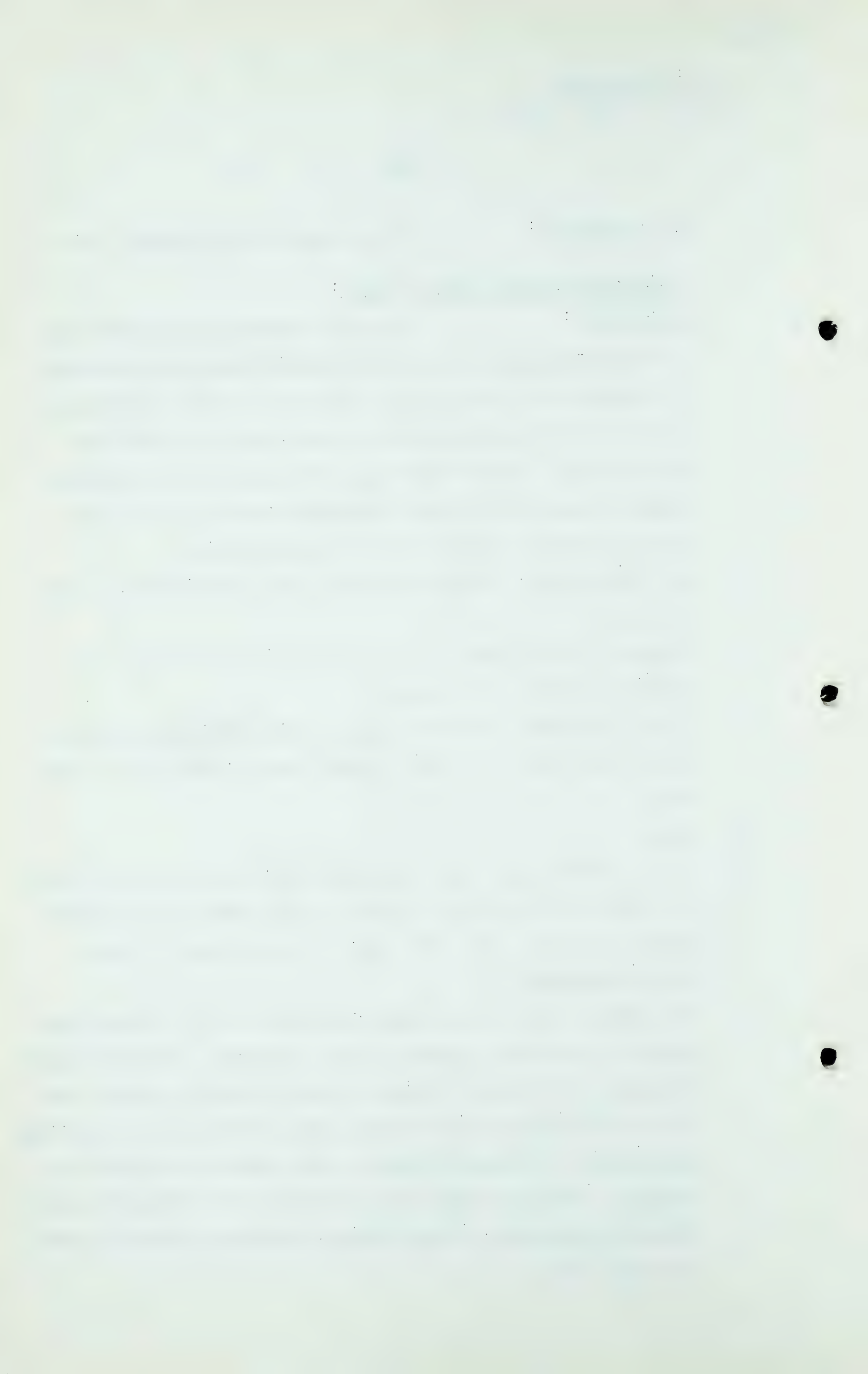
A Excuse me, Mr. Nolan, I am an inexperienced witness. Is exhibit 103 the presentation?

Q Yes, I am sorry. They have given this submission of yours that number and if you will please look at the foot of the page . . .

A Yes.

Q . . . you will see under heading 2 that you say you will pay the sellers of this gas a price as favourable as any other system can pay. Now, what price do you propose to pay, Mr. Williamson?

A My answer to that, Mr. Nolan, will have to be a general one, because I am not an expert on these matters. We have expert witnesses to follow. My observation is based on this, that we are building our line through easy country and are selling immediately for immediate sale to the Northern Natural Gas Company. We have a high load factor and it follows from all these circumstances, in my opinion, that we could do as well as anyone else.



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Q Are you prepared to meet a price of $10\frac{3}{4}$ cents, plus an annual increase of $\frac{1}{4}$ of a cent, which has been referred to and established in evidence in the record in this case?

A I believe if it is possible for any other one to pay that much it is possible for us to do as well.

Q I notice on page 2 that you say under heading number 4 that it will enable to development of northern Alberta and of northern British Columbia to proceed instead of denying those areas a market for their gas. I take it from this statement of yours, Mr. Williamson that your intention is that gas should be taken from northern Alberta and northern British Columbia to the Pacific Northwest. Is that the proposition?

A Yes, sir.

Q That, of course, depends on whether or not in the first place there is sufficient gas in the Peace River and northern Alberta to supply the requirements of the Pacific Northwest?

A I would agree with that.

Q Do you know what those requirements are and what the reserves are?

A I do not.

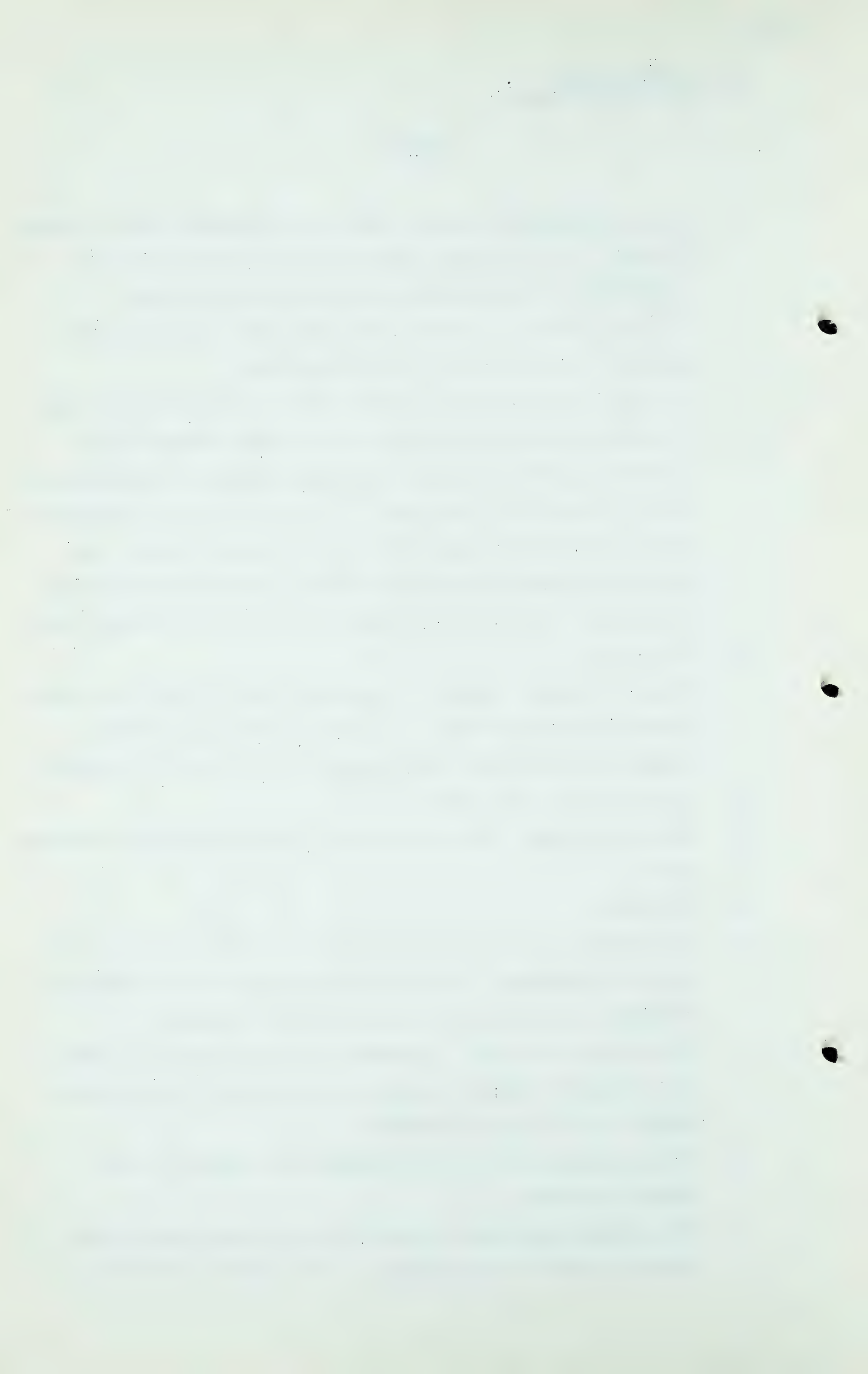
Q I suggest to you that the best way to develop Alberta is to bring the northern Alberta gas down through the Province of Alberta to the Southern portion of that Province?

A That is not our view. I presume the Board wants our view.

Q You proceed to develop Alberta by taking gas from northern Alberta into British Columbia?

A Yes, so that there will be a market for the gas in the South elsewhere.

Q You are assuming there is sufficient gas available in the north to meet the requirements of the Pacific Northwest.



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Now, you say in 5 that you would deliver gas from Southern Alberta to the Canadian prairies who need it most. Are you making a comparison there between the needs of Vancouver and other places and that of the Prairie Provinces?

A It was my intention in that paragraph number 5 that it should include that last sentence, and the statement including the last sentence is that Vancouver could get it anyway.

Q Let us read it and see what it does say. "Deliver gas from Southern Alberta to the Canadian Prairies who need it most, which areas will go without gas if Southern Alberta gas goes to the Pacific Coast. As previously stated, the latter area can be supplied from Northern Alberta with great advantages to Northern Alberta." So we are back to where we started out?

A Yes.

Q Your intention was to supply the Pacific Northwest from Northern Alberta and Northeastern British Columbia?

A That is right, sir.

Q And you mention also the experience of International Utilities in the field of natural gas distribution. What do you know about the experience of International Utilities in this field?

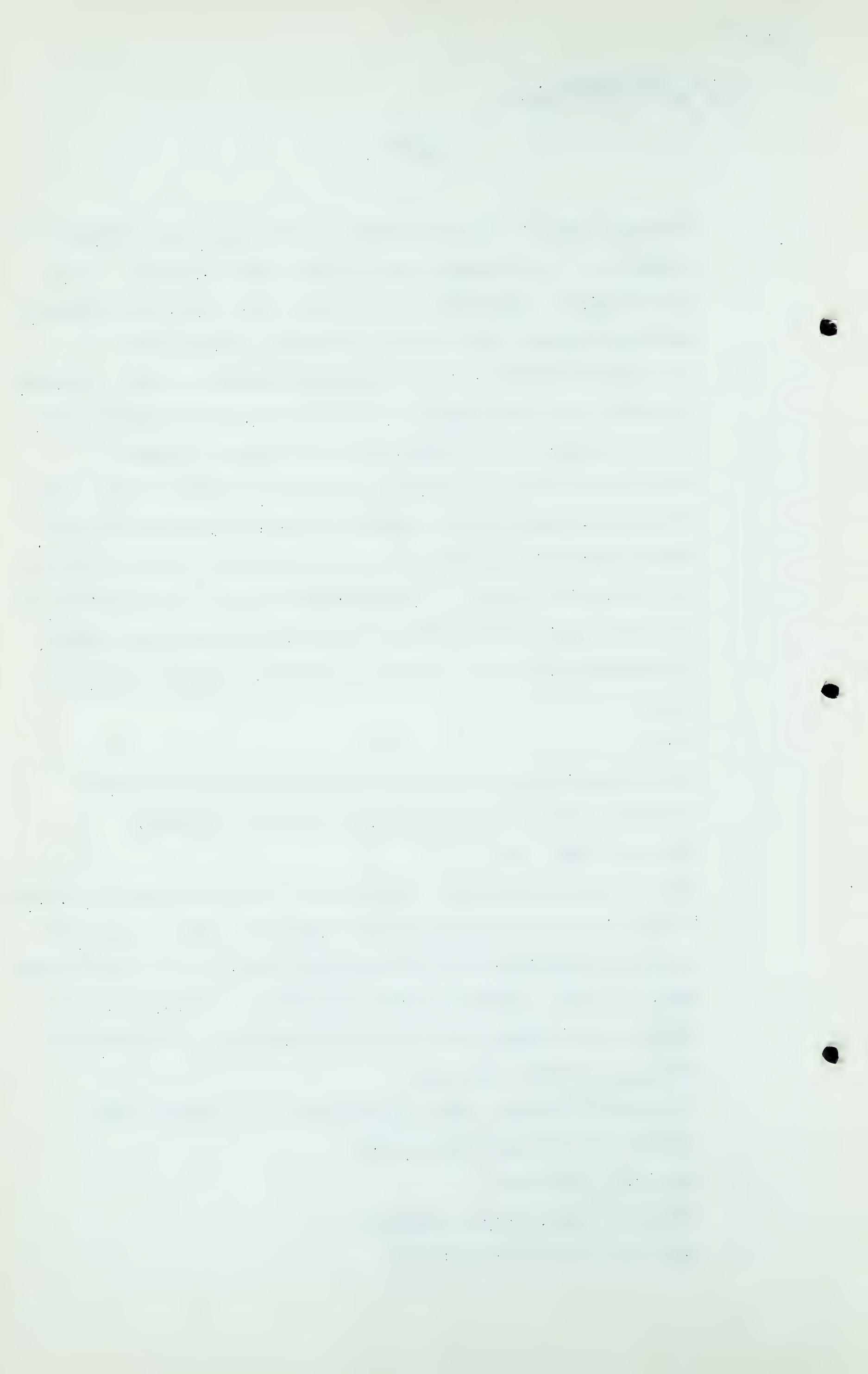
A Well, we have distributed the securities of Canadian Western Natural Gas Company and have some knowledge, as a result of that, as to what they do.

Q You are telling me that the securities of International Utilities are distributed here?

A No, sir, I did not.

Q That, of course, only applies . . .

A No, sir, I did not say that.



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Q Canadian Western securities are distributed?

A Yes.

Q That is, of course, only in the local distribution field, is it not?

A Yes.

Q What experience has International Utilities had in trunk pipe line operations?

A I should say none.

Q Then you say in the last paragraph of page 3,

"Colonel Baxter, the President of this company, has frequently stated the guiding policy of this project - namely, to provide natural gas for the people of the Western Canadian Prairies at the lowest possible rates."

I suppose you know, or do you know, that there is a large exploration program now being commenced in the Province of Saskatchewan, and to some extent in Manitoba?

A I have heard of it, yes. I am aware of it, yes.

Q I suppose you would, if gas is found in quantity in Saskatchewan or in Manitoba or in both - it would be cheaper gas than you could obtain in the Province of Alberta?

A If that should happen it is our intention that we should find a market for it as rapidly as it was possible to do.

Q And what would happen to the gas that you would buy from the Alberta fields, would you cut that off?

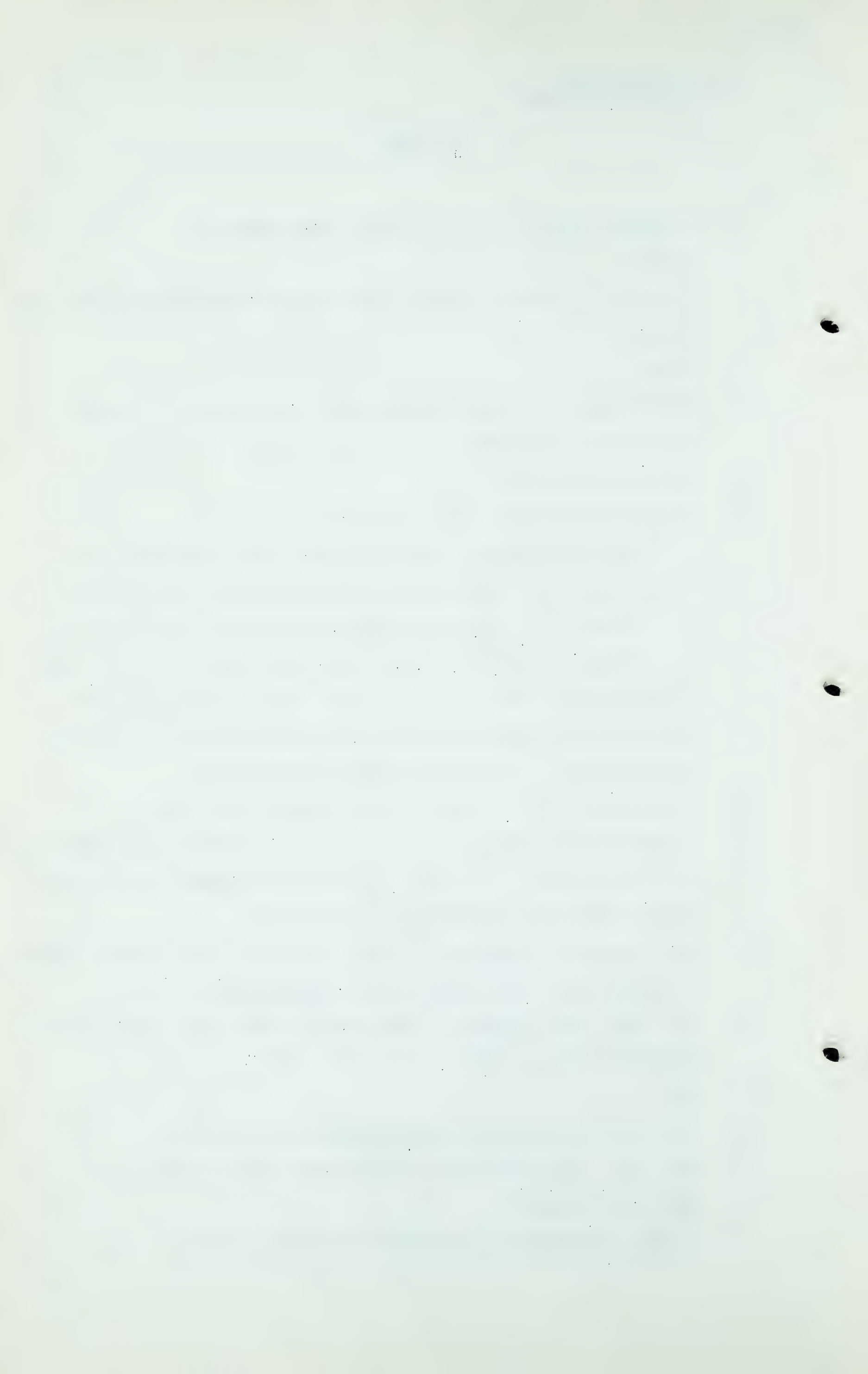
A No.

Q And take your gas from Saskatchewan and Manitoba?

A No, sir. Our market is flexible and would expand.

Q What did you say?

A I said our market is flexible and would expand.



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Q What market is flexible?

A The market of the Northern Natural Gas Company.

Q You have a contract with them, have you?

A Yes, sir.

Q What prices do you pay for their gas?

A We do not buy gas from the Northern Natural.

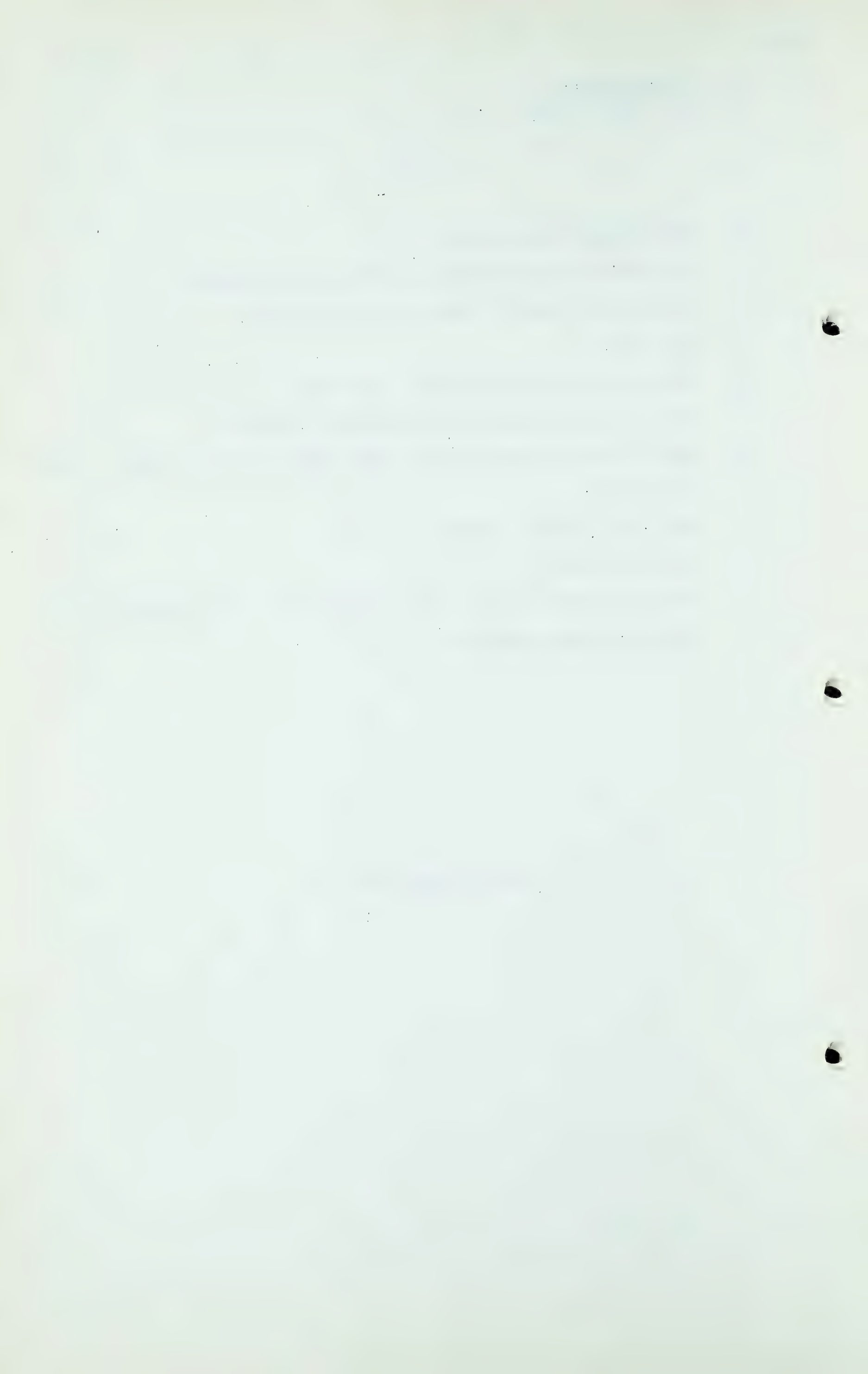
Q What do you do with them? They agree to deliver gas to you,
do they?

A No, sir, we sell to them.

Q At what price?

A The price has not yet been established. The contract with
them has been submitted.

(Go to page 2891.)



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Q We will see what it says. This is Exhibit 104. I am reading from page 8:

"Western agrees to have available for delivery to Northern at the delivery point referred to in Section 1-a hereof, or at such other delivery point on the International border as may be mutually agreed upon by Western and Northern, a minimum of 100 million cubic feet of natural gas per day at a delivery pressure of 350 pounds per square inch, for a period of 20 years from the date of first delivery of natural gas by Western to Northern hereunder."

Now, you see, in paragraph 5 it says:

"Western agrees that Northern shall have a continuing first opportunity to purchase from Western all natural gas that Western has available at any time for export to the United States of America, upon reasonable terms to be mutually agreed upon."

Is that what you mean when you say there has been no price established as yet?

A I did not refer to that clause. That clause, of course, means that if there is any market in Canada for the gas that Canada should get it first.

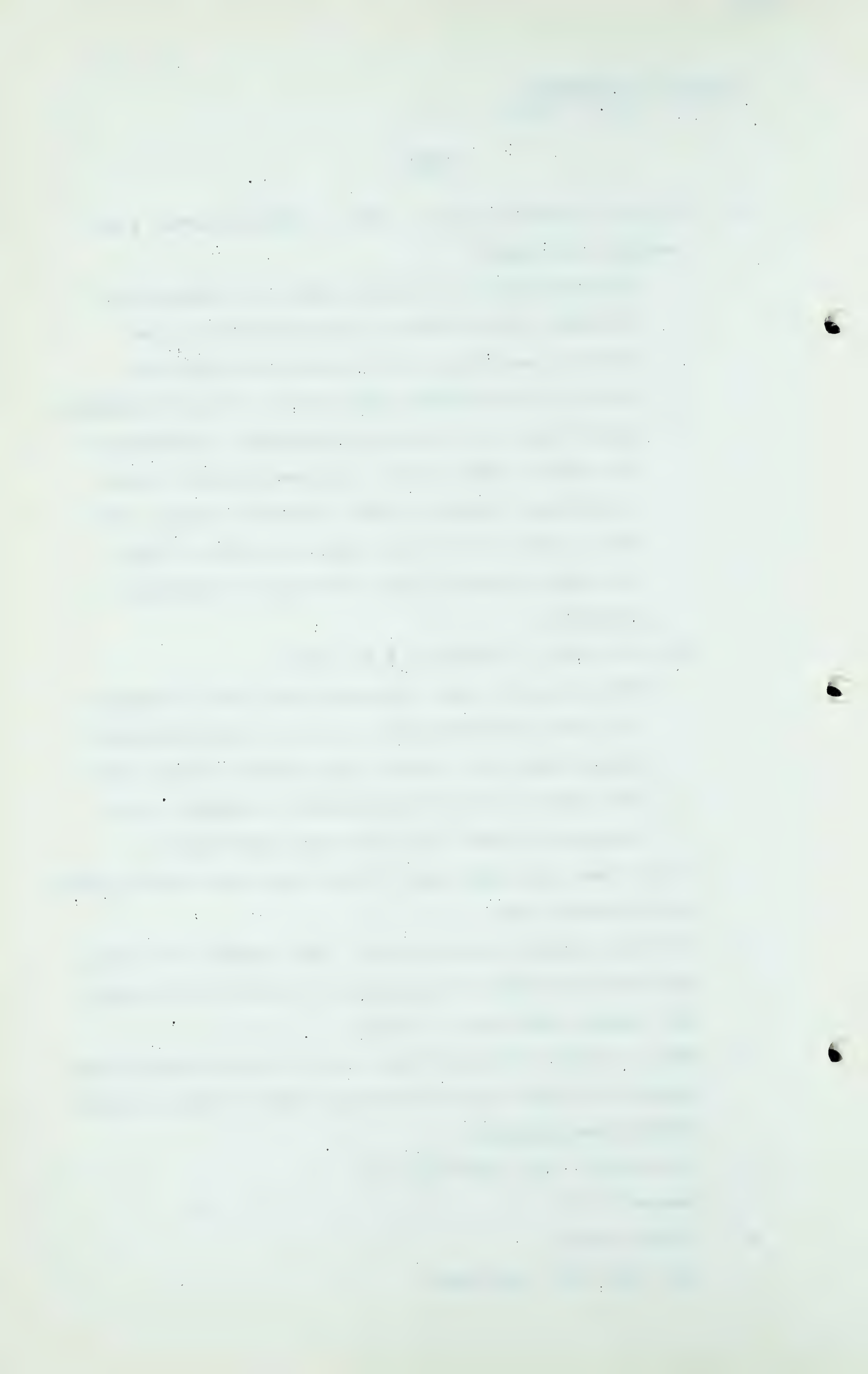
Q Well, I would like you to tell me, if you can, what price Western is going to get for the gas that it sells to the Northern Gas Company?

A I am sorry, I can not tell you.

Q Because -- ?

A I don't know.

Q Well, when will you know?



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A When we finalize our final agreement, I suppose.

Q Well, now, you are a banker, Mr. Williamson?

A Yes, sir.

Q Can you say to me that this project is economic if you do not know the price at which Western is going to sell to Northern?

A Well, we have submitted a document of operating estimates prepared by Stone & Webster Service Corporation, and senior officials of Stone & Webster Service Corporation are here and I think will be able to answer your question on this subject much better than I can, except that I should say that based on the information they have given me I believe it to be economic.

Q Well, in coming to a conclusion that it was economic, what price did you have in mind?

A As to sales price, sir?

Q Yes?

A Well, the document that has been filed by Stone & Webster shows 27.8 cents average.

Q What price is 27½ cents? Is that the cost of transportation?

A That is the --

Q I don't care what Stone & Webster have to say, I want you to tell me as a banker who says this is economic what price you had in your mind should be received by Western from Northern?

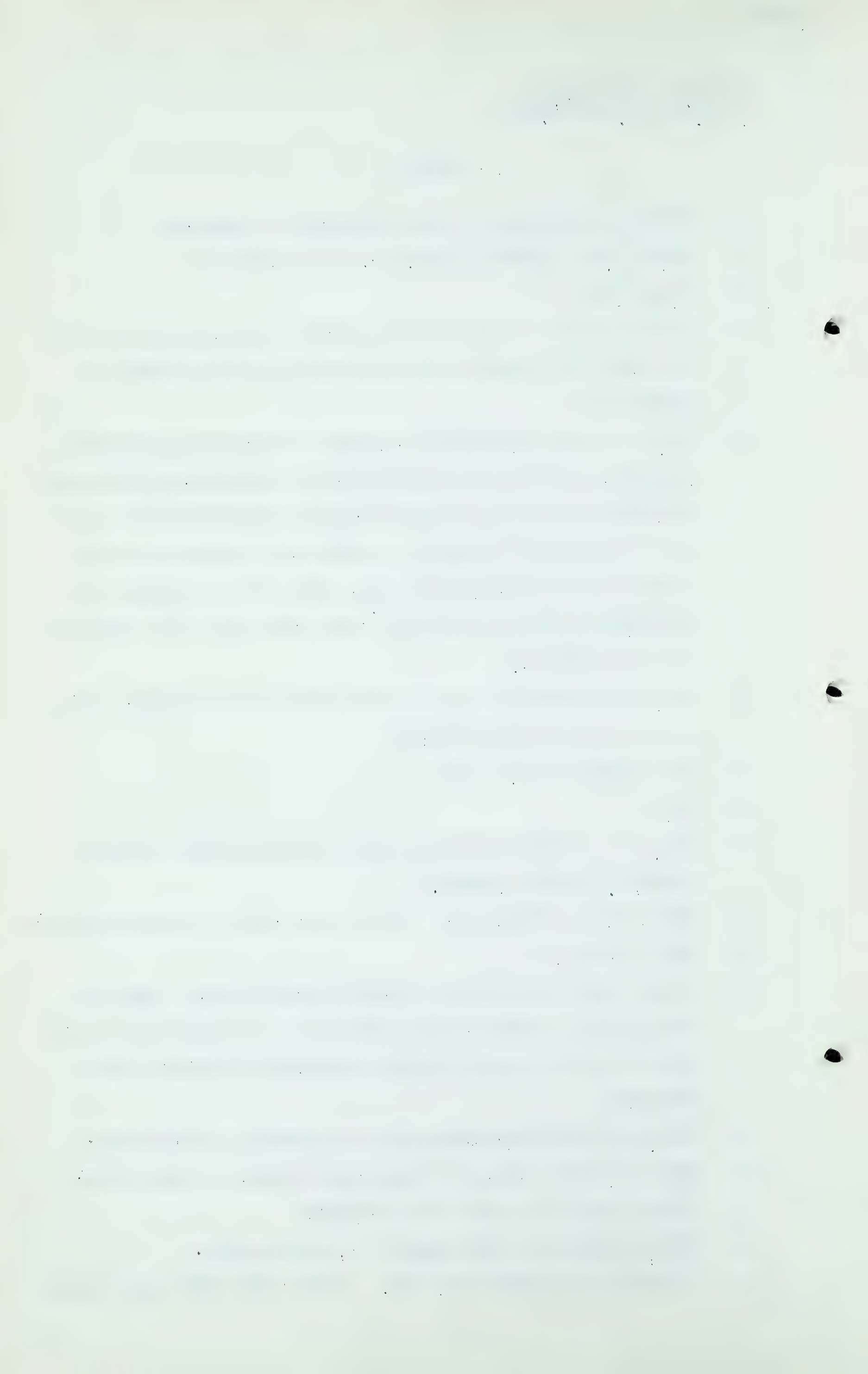
A Well, the total estimated cost of service is 27.8 cents.

Q What does that include? What field price, to begin with?

A Do you wish me to read their report?

Q Well, refer me to the page of it, if you will.

A I would be delighted to, sir. I don't know what the exhibit



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here is.

Q It has not been marked. If you identify it by name.

A It is called, "Western Pipe Line Operating Estimates prepared by Stone & Webster Service Corporation, November 1951," and it is only three pages long.

Q Well, will you look at that page. Can you tell me what the field price is?

A Sir, I think it would save the Board quite a lot of time if they direct these questions to an expert witness. I know nothing about these subjects on it.

Q But you came here?

A Pardon me for interrupting.

Q I am sorry, I interrupted you.

A My conclusions have been based on being told how much revenue we will have and how much coverage we will have. Back of that I am quite incompetent to discuss these details.

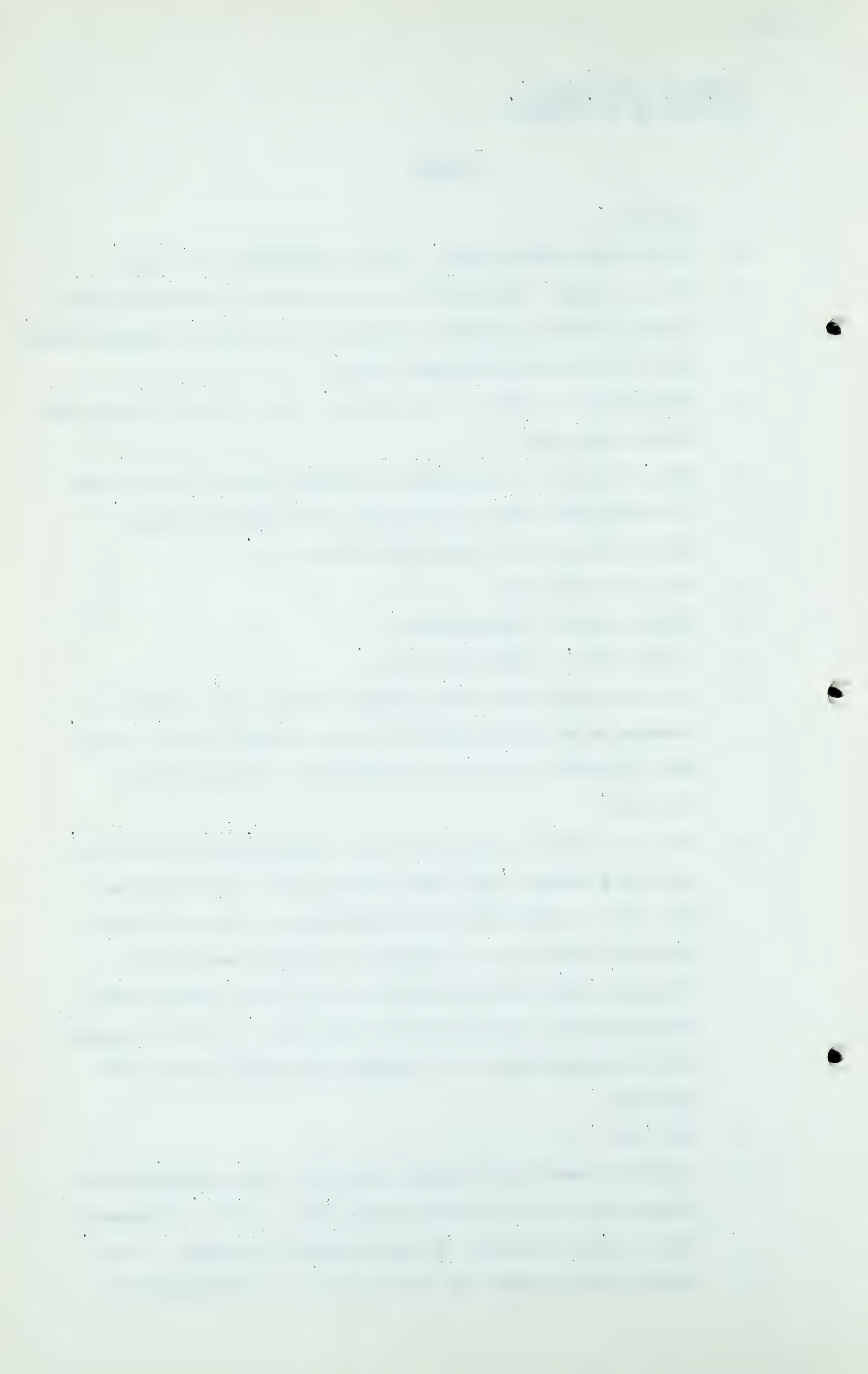
Q Well, you are an officer of the company, Mr. Williamson, you are a banker, you come here and you are telling us that this is the finest and the best and the only thing we should have for the benefit of Alberta and British Columbia, and I would like you to tell me, give me some facts on which you base that conclusion. I am not asking you to address myself to somebody else who has not yet appeared.

A Yes, sir.

Q I take it that this document that you have presented was written for you by somebody else, was it, Mr. Williamson?

A No, sir, not entirely, it was written by several of us.

Q Can you tell me what the gate price is in Minneapolis?



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A No, I can not, but I expect that the witnesses for Northern Natural can do so.

Q Well, now, refer to this figure of 27.8 cents, Mr. Williamson?

A Yes, Mr. Nolan.

Q That is the total estimated cost of service per Mcf.?

A That is my understanding.

Q And to that we must add, of course, the field price of the gas, must we not?

A I would imagine so.

Q So what figure will we add to 27.8 cents?

A I think we were considering somewhere between 10 and 11 cents, to my recollection.

Q Did that have in it what is called an escalation clause, that price structure to which you are now referring?

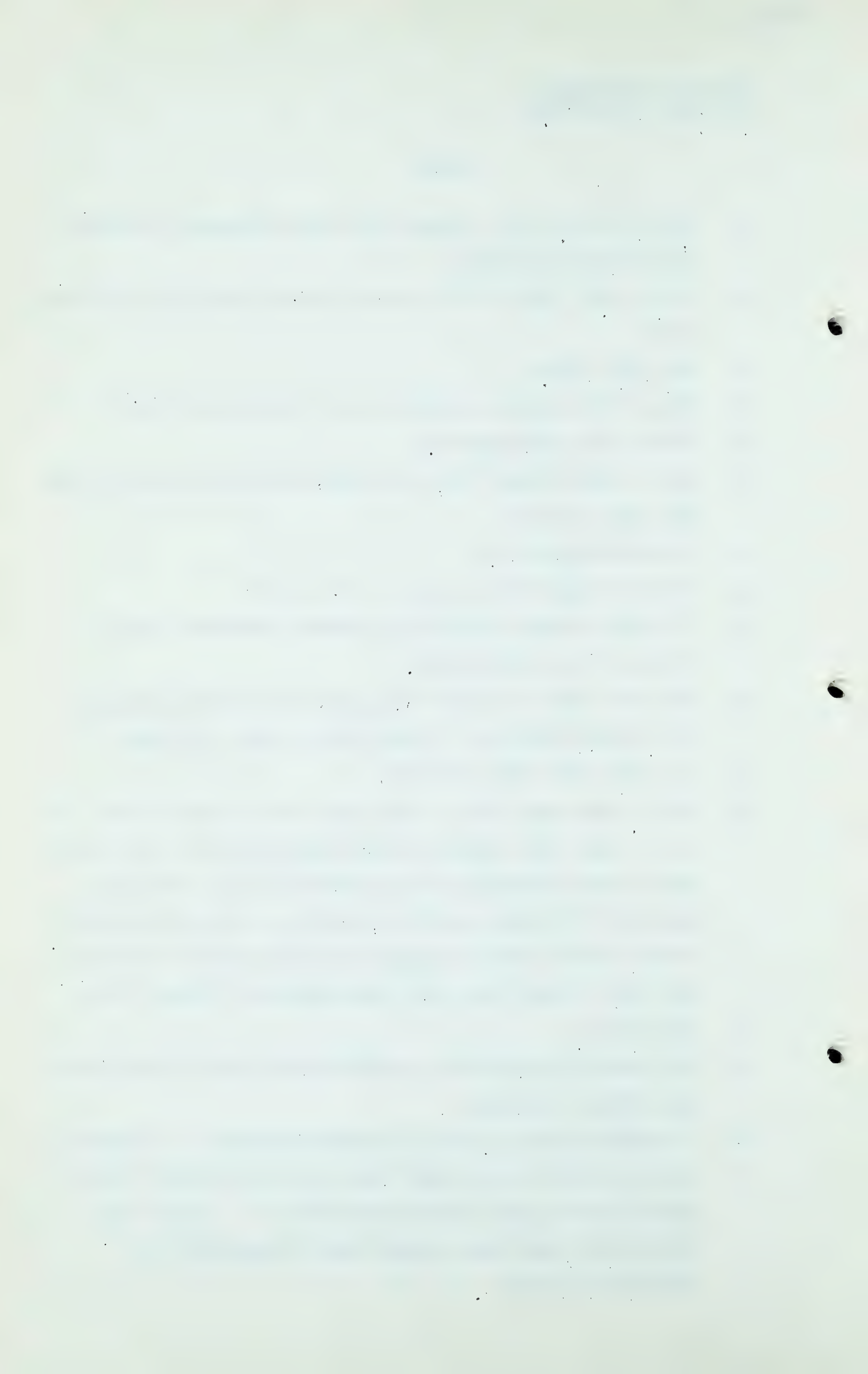
A I do not know what you mean.

Q Well, that means that -- there has been evidence given here in the case and contracts have been presented to the Board which would indicate in the first year there would be a price of "X" cents per Mcf., and that in succeeding years there will be annual increases in that price of 10 cents, and that is what they call the escalation of that price.

A Yes, sir.

Q This same price does not go through the whole thing, there are annual increases.

A I understand now. Would it be satisfactory if I answered your question in this way, that we do not believe that we should get the gas from the sellers of it on any less favourable terms than anybody else is agreeable to, escalator or not.



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Q Have you any mind of your own on this thing or do you follow somebody else's thought?

A No, we take the point of view that we do not wish this Board to injure anyone that has a contract in order to do business with us.

Q Oh, I see. In the event of your getting the permit you would be very happy to take over the contracts that are now in existence on their present basis?

A Well, I would prefer not to have words put into my mouth. I will repeat what I said, that we do not expect to purchase our gas at prices less favourable than others are prepared to pay.

Q Well, then, if you have a total estimated cost of service per Mcf. of 27.8 cents, Mr. Williamson?

A Yes, sir.

Q And you add to that your price of 10 to 11 cents, which you referred to a few moments ago, you come to a price of approximately 37.8 cents per Mcf., will you not?

A There must be something wrong with that and I do not know what it is.

MR. C.E. SMITH:
the field price.

I can tell you, it includes

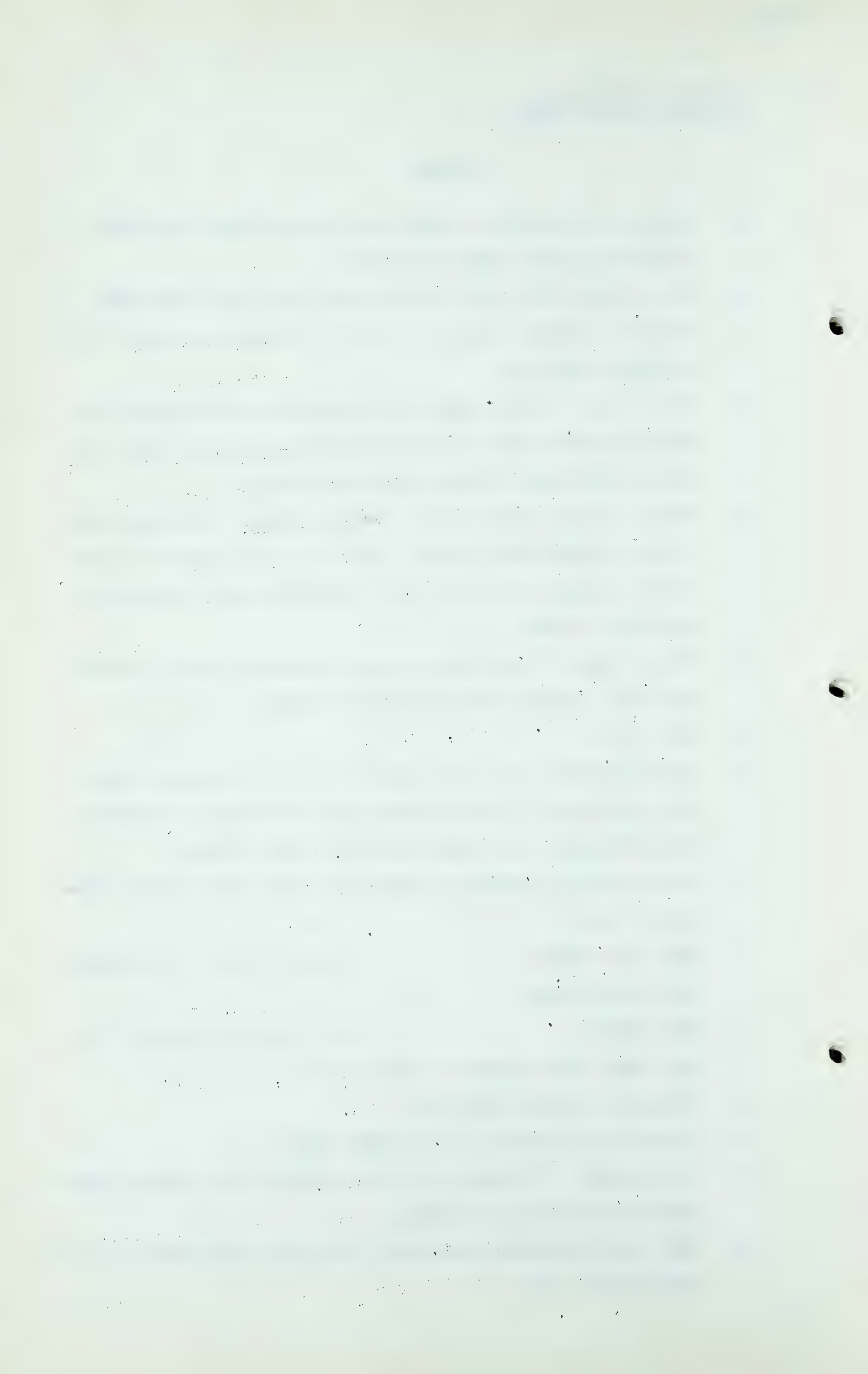
Q MR. NOLAN: Well, then, why didn't you tell me? That is what I asked you.

A Because I am not competent.

Q I guess we were both in the same boat.

A I am sorry. I suppose it is the trouble with getting substitutes at the last moment.

Q Yes. And delivering material for cross-examination at the last moment, too.



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A It is hard for a substitute to prepare it at the last moment, sir.

Q You told me that you would not want the producer to be hurt in any way because of the price that you were willing to pay for the gas as compared to the prices that other people were willing to pay?

A We believe that our scheme is such that he need not be hurt.

Q You would be willing to take from those producers gas in the same quantities as the other people have contracted for?

A Yes, sir.

Q In every instance?

A Yes, sir.

Q And over the same period of time?

A Yes, sir.

Q Now, I notice on the last page of your submission, page 6, you refer to it as being a Canadian project which would supply the most deserving Canadian market. Would you tell me what percentage of the gas that you will take from Alberta will be consumed in the Dominion of Canada and what percentage will be consumed within the United States of America?

A Well, I do not suppose I can forecast the future, Mr. Nolan.

Q No, but you know something of the present, I take it?

A My recollection is that the load we hope for in the Prairie Provinces is about 25 per cent more than the committed amount in the contract with Northern Natural, the original committed amount.

Q Would you mind repeating that, I do not think I followed you.

A My recollection is that the ultimate market we expect to

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develop on the Prairie Provinces -- now, I have some actual information which will be better, I am sorry. May I start again?

Q Yes, please.

A The estimated sales and gas requirements are calculated in a document which has been filed called Western Pipe Lines Estimated Markets and Gas Requirements prepared by Stone & Webster Service Corporation, and the information is in Appendix 4 of that document. I see from that that in the fifth year of operation the annual requirements are 76. I never know whether they are trillions or billions or what they are.

Q Neither do I.

A 76 something.

Q Where does the 76 appear?

A The third column at the bottom.

Q 76,471,700?

A Yes, sir, and that compares with our committed amount to Northern Natural of 100.

Q And where is that figure? Oh, yes, I see it.

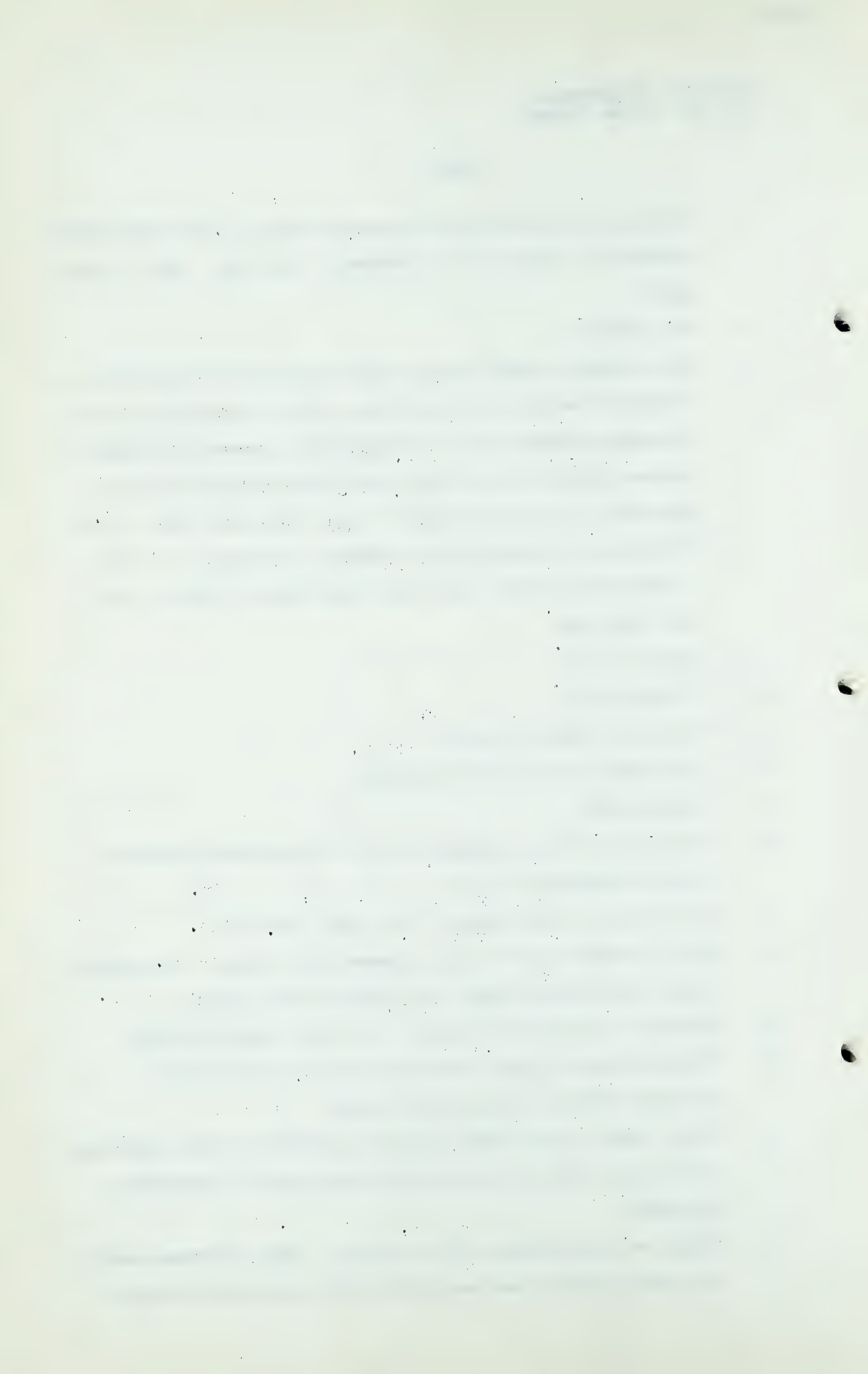
A May I correct my evidence, please, Mr. Nolan. I am afraid I was quite badly mixed up on what I said there.

Q Perhaps I insisted in that. I did not intentionally.

A That column of 76,471,700 does include the sales to Northern Natural in the fifth year.

Q Well, what I really was trying to get at is what percentage of the gas you will take from Alberta goes to Northern Natural?

A Well, we would start off, of course, with a minimum market in that territory and would take all that was available



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while we were developing the Western Prairie market, so that we would have a minimum demand for gas and minimum revenue, unlike other lines that would have to wait until they developed their business, but the percentage would actually increase year by year as the Western Prairies were developed. The point to which we can develop them must be in this market survey somewhere.

Q I would think that the Northern Natural's potential increase would be very great, too, Mr. Williamson?

A Yes.

Q Perhaps greater than that of Prairie's?

A Yes, but they have other supplies.

Q Why don't they use that and leave Alberta's gas alone?

A Well, my answer to that is that we want to serve the Winnipeg and the Western Prairies and they can not get any there otherwise.

Q In other words, you have to have an American market to make Winnipeg feasible?

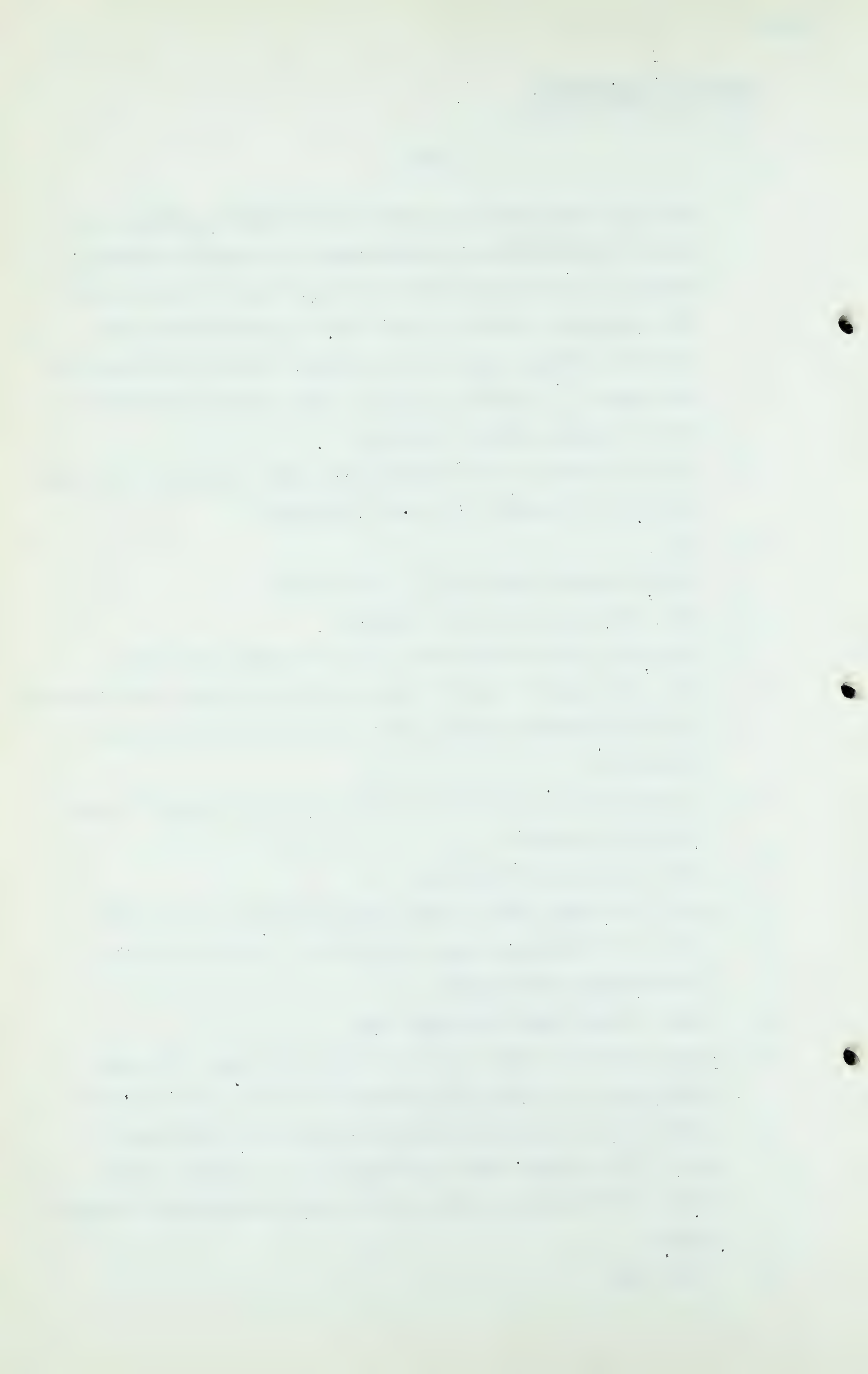
A Just the same as Vancouver.

Q And of the gas that is taken from Alberta, of the total sales of 74 billion, some 54 billion of that will go to the Northern Gas Company?

A That is what that statement says.

Q Just excuse me until I look at this last page. Now, Mr. Williamson, we have been concerned here for some two years with various routes proposed by various applicants and one of the things that the Board has to consider and is still considering is which is the most economically feasible route.

A Yes, sir.



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Q But if they take your word for it, they won't have any more doubt or difficulty about the matter because you say quite boldly on page 6 that it is the most economically feasible route of any submitted by the applicants seeking to supply Canadian markets.

A I expect the Board will look into that quite carefully, sir.

Q Well, I am sure you want to be of all the assistance you can?

A That is correct.

Q Now, perhaps you will help the Board to come to a conclusion. Why is your route the most economically feasible?

A Well, my answer to that is, first, that it is level prairie country, that it is easy to build on, and that it has a market waiting at the end of it to turn the valve the minute you get the last pipe laid.

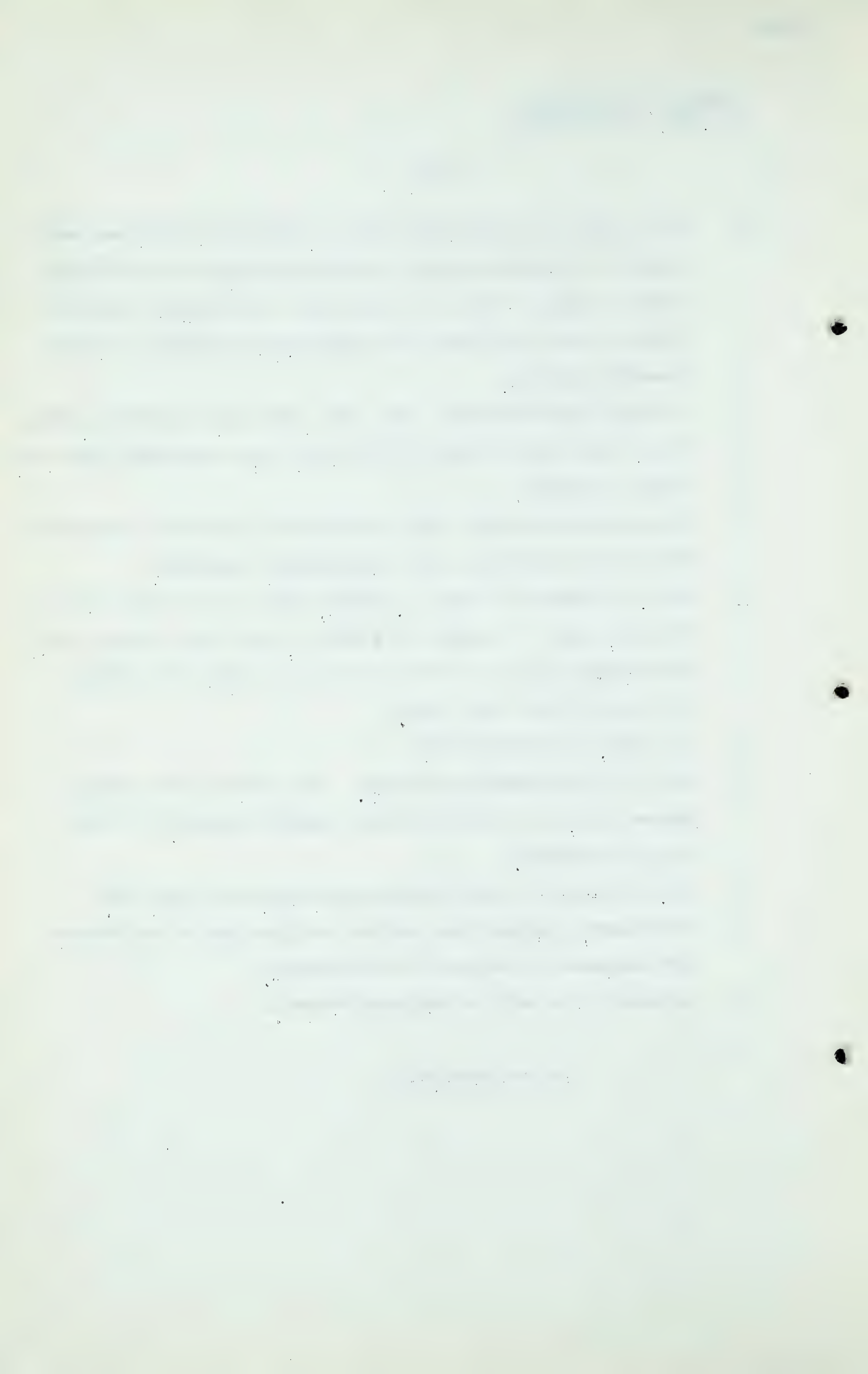
Q You mean, in Minneapolis?

A Well, at the Canadian boundary. This line is not going to Minneapolis, it is going to the Canadian border. It will be all in Canada.

Q Yes, but that is only a play upon words, you know, Mr. Williamson, because you just do not take gas to the border for the sake of taking it to the border.

A We take it to sell to Northern Natural.

(Go to page 2900)



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Q I would have thought so, yes.

A The point I was trying to make clear is that our line is not in the United States anywhere.

Q No, but your market is to a very large extent?

A Yes, it is.

Q Have you anything that you could tell me about the large industrial load in Canada over your line?

A Well, now, I imagine we have got information to put in on that also.

Q What do you know about it?

A The industrial load?

Q Yes?

A I only know about it in a general way. I lived in Winnipeg for quite a while, 12 years.

Q Well, you were not selling gas, were you?

A No, sir. There is a document here that you have of estimated markets and gas requirements, also prepared by Stone and Webster, which contains that detail, and on which they will be subject to examination, I suppose.

Q Well, as I understand your evidence, Mr. Williamson, it has to do with your willingness to finance this project in the light of what Stone and Williamson are going to tell us, is that it?

A Stone and Webster.

Q Stone and Webster?

A Yes, Stone and Webster. We are going to depend largely on their advice, because that is what we engaged them for.

Q Well, now, who is going to make the decision, are Stone and Webster, or are you?

A What decision, please, Mr. Nolan?

A. H. Williamson,
Cr.Ex. by Mr. Nolan
Cr.Ex. by Mr. S. B. Smith

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Q The decision as to whether this project shall be carried out?

A Western Pipe Lines are going to make the decision.

Q And who is to make the decision as to whether this project can be financed?

A Western Pipe Lines advised by Nesbitt, Thomson & Company, Wood, Gundy & Company, and Osler, Hammond & Nanton. May I interrupt for a moment, Mr. Nolan?

Q Yes?

A I am just reconsidering my answer to the previous question, when you said "Who is going to make the decision as to whether this line is going to be built or not", and I suppose I should have said the Board instead of Western Pipe Lines.

Q Oh, well, in our discussions we do not pay any attention to the Board. All right, then, thank you, Mr. Williamson.

.....

CROSS-EXAMINATION BY MR. S. B. SMITH:

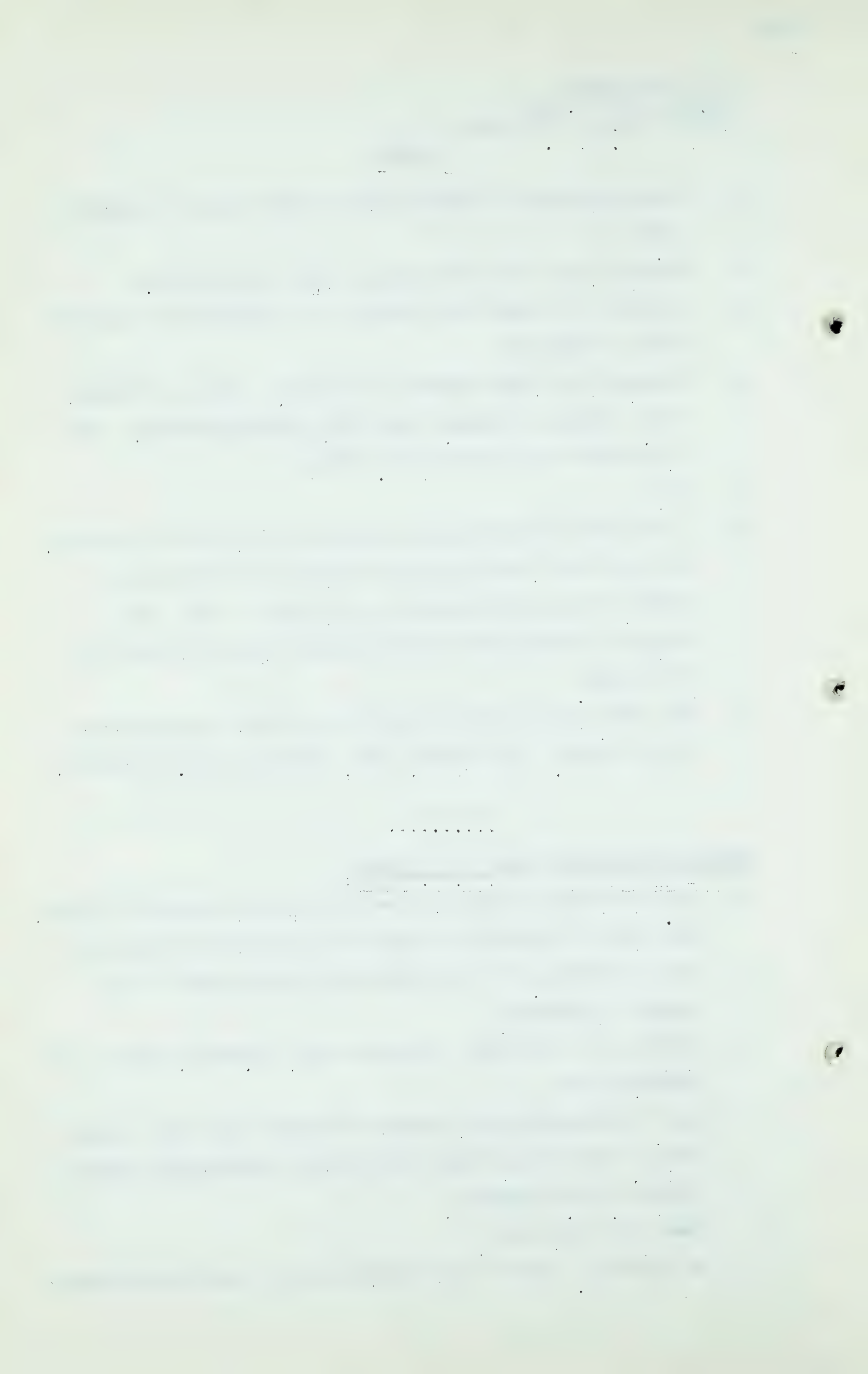
Q Mr. Williamson, I take it that you are now saying, in effect, that in your contention there is an exportable surplus of gas in Alberta, over the reasonable requirements of the people of Alberta?

A Would it be reasonable for me to ask, Mr. Smith, who you are speaking for?

Q Yes. I am speaking for Pacific Northwest Pipe Line Corporation, Prairie Pipe Lines and Prairie Transmission Company, Limited, Mr. Williamson.

A Thank you very much.

Q By the way, you are not entirely new to these proceedings?



A. H. Williamson,
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It seems to me that I remember that nearly two years ago you were here giving evidence?

A That is correct.

Q In effect, you are saying there is an exportable surplus over the requirements of the people of Alberta?

A We do say so.

Q You do say so?

A Yes, we do say so.

Q Now, I suppose you would agree, because it seems to be pretty clear, that the closer the production of gas is to the market for gas, the cheaper the gas is to the consumers who use it, as a broad proposition?

A That sounds to me like a reasonable proposition.

Q And you, I take it, have been following to some extent, the development of the gas resources of Western Canada? You are interested in them?

A Yes. I am interested in them, but I do not consider I know very much about them.

Q And you propose, that is, Western Pipe Lines, proposes to deliver gas to Swift Current, Saskatoon, Regina and Moose Jaw, a good part of the Province of Saskatchewan?

A We hope to.

Q And have you been reading that they have been finding some gas in Saskatchewan?

A I have read so, yes.

Q Did you read this morning that they had found quite a big well 160 miles southwest, I think it was, of Saskatoon, yesterday, that has been brought into production?

A I did not see that.

Q Well, now, these proceedings have been going on for some time

A. H. Williamson,
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and it might be possible that there might be sufficient gas developed in Saskatchewan, that is to the east of Alberta, large enough to take care of the market in Saskatchewan, and perhaps before these proceedings are wound up? That is possible, at least, Mr. Williamson?

A It seems to indicate a rather lengthy Hearing.

Q Well, how long is it since you were here before?

A I cannot tell you, but it was quite a long time ago.

Q Well, would you agree that there has been a lot of gas found in Alberta since you were here before, wouldn't you?

A Yes, sir.

Q Because you remember your President, Mr. Baxter, about a year and a half ago coming into the witness stand here and taking the position that there was not enough gas in Alberta?

A I recall that.

Q And now you say there is enough gas?

A That is correct.

Q So that in that period, I think it was a year ago September, the situation has changed materially in Alberta, hasn't it?

A That is correct.

Q Now, if gas should be found in substantial quantities in Saskatchewan, or Saskatchewan and Manitoba, those sources, of course, are much closer to your proposed market than the Alberta sources are?

A Saskatchewan is the closer to Saskatchewan and Manitoba than Alberta is, I will admit that.

Q And if gas should be found there in substantial quantities before your scheme was put into being, it would be pretty difficult for you to compete with Saskatchewan gas, I suppose?

A. H. Williamson,
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A Well, we would take it.

Q And you would take Alberta gas too?

A Yes, sir. And if it is in order for me to do so, I would like to comment that Saskatchewan is not the only place that gas might be found. I suppose it might be found almost any place, and upset the factors on which this Board is considering the situation.

Q Yes. But, of course, you do not yet know whether you would be able to get any gas in Saskatchewan, assuming there was a surplus of gas there over the requirements of the people of Saskatchewan, do you? You cannot tell, can you?

A I am terribly sorry, I did not quite follow you.

Q You cannot tell whether you could get gas, whether your Company could get gas in Saskatchewan, if there were there a surplus over the requirements of the people of Saskatchewan?

A You can't tell?

Q You can't be assured that your Company could get the gas in Saskatchewan?

A I assume we would if we had a pipe line company running through it, because we could be able to make a much better proposition to the people if the pipe line was there.

Q If your pipe line was there first?

A Yes.

Q But there might be another one from Saskatchewan, suppose there were?

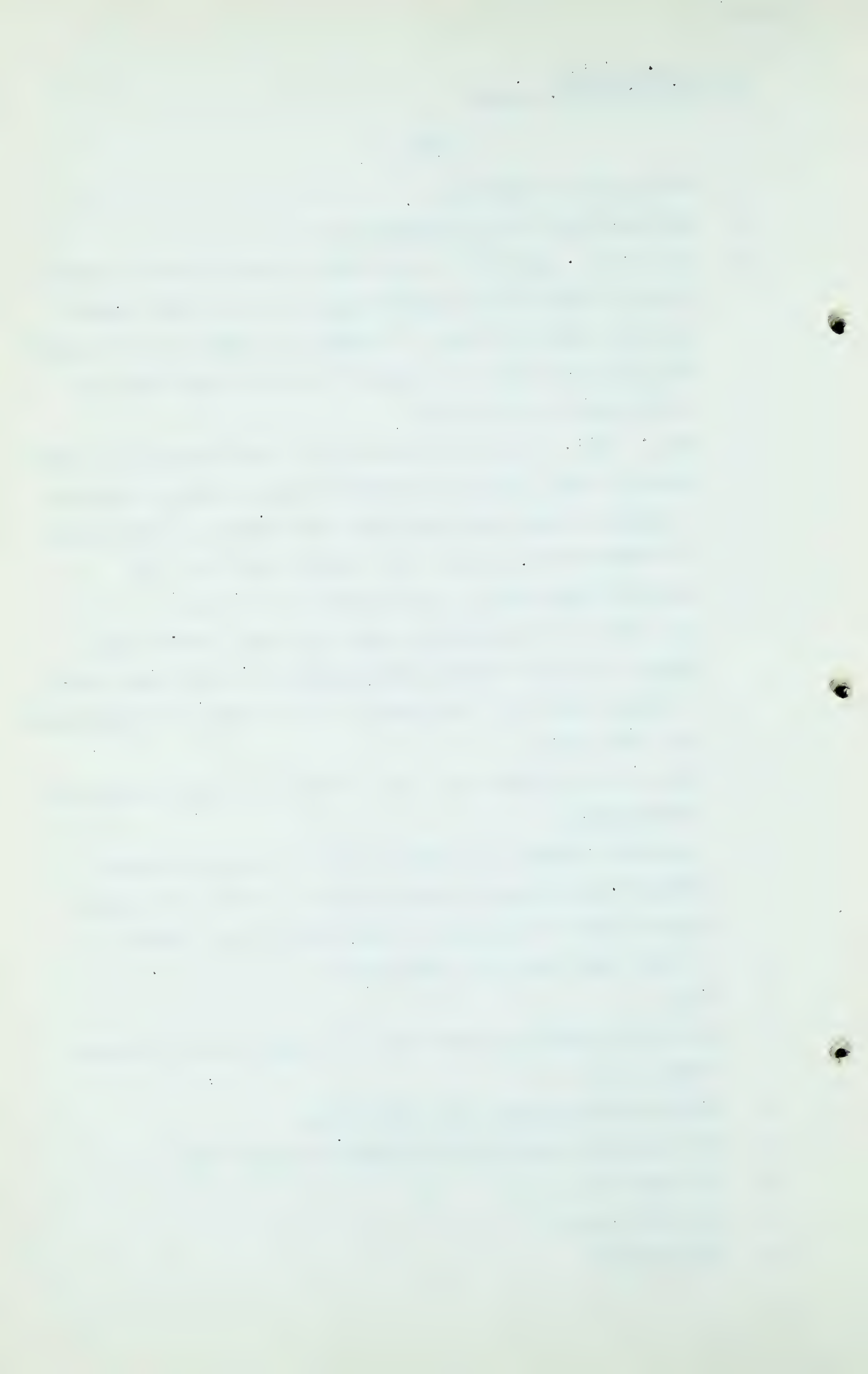
A Well, we are hoping to be there first.

Q And perhaps someone else is hoping to there first?

A It could be.

Q I do not know.

A It could be.



A. H. Williamson,
Cr. Ex. by Mr. S. B. Smith

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Q Well, now, Mr. Williamson, you have told us here that Western Pipe Line has been financed by various people, including your own firm, and I suppose the people who are financing Western Pipe Lines are backing it in its efforts to bring this scheme into existence?

A In every way we can.

Q Yes? All of the people who have contributed to the financing of it?

A Well, we have had no help from the International Utilities, if that is what you are getting at.

Q I do not know. You say it has been financed to date by your own firm, Osler, Hammond & Nanton Limited, Nesbitt and Thomson Company Limited, all strictly Canadian companies, by International Utilities, an American company about 30% Canadian-owned, and by Anglo Canadian and C. & E. Is that statement correct?

A Yes, sir. What portion of it do you question?

Q Well, the whole statement, is it correct or not?

A I believe it to be accurate in every particle.

Q And those are the people who are backing you here today, I take it?

A That is correct, Mr. Smith.

Q And International Utilities is the holding Company that controls Canadian Western Company and Northwestern Utilities?

A Are you asking me, Mr. Smith?

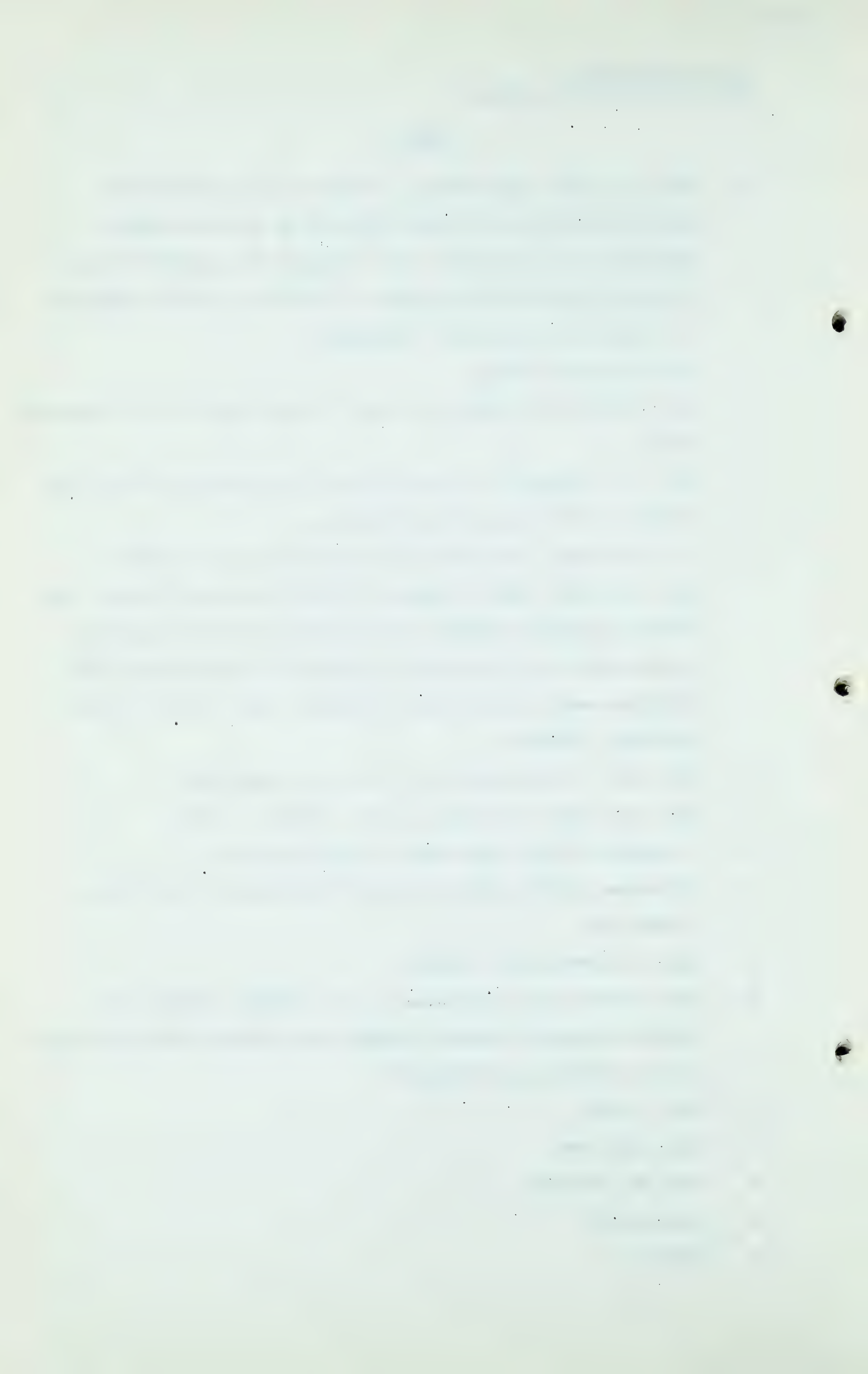
Q Yes, I am?

A Yes, they are.

Q Now, Mr. Brownie. . .

A Pardon me?

Q Yes?



A. H. Williamson,
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A Would you be interested in the percentages of interest of these different people?

Q Well, I am not particularly interested.

A Or would you like to know that none has more than 25% interest?

Q Well, I will accept your statement as to that, Mr. Williamson. Mr. Brownie, the President of Canadian Western Company and Northwestern Utilities, gave evidence here a few days ago, and, as his first conclusion, he advocated before this Board that there should be no export of gas from the Province until proven reserves exceed the Board's estimate of Alberta's 30-year requirements, including those quantities necessary to assure a 30-year deliverability. Now, I take it that you, representing the people that you are here representing, having taken the view that there is an exportable surplus, as roughly defined by you and me a little while ago, are today saying that there are proven reserves in Alberta which exceed the Board's estimate of Alberta's 30-year requirements, including those quantities necessary to assure the 30-year deliverability.

A That is what we are saying, yes.

Q Yes?

A I would think . . .

Q And International Utilities, who control Canadian Western Company and Northwestern Utilities, are behind you in the evidence you are giving here today, and in the application of Western Pipe Lines?

A Well, they are associated with us in a minority position, and if I can comment on your question, I would say that the International Utilities' shareholding ownings as to Canadian

A. H. Williamson,
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Western were smart enough to realize that the local management are much more competent to look after their interests than they are from down in New York.

Q Yes, but the final control rests where?

A I would say that the final control as to what reference was made to the Board, or as to what representations are made to the Board, and how the local companies are operated, and what representations they might make on behalf of the local companies, rests with Mr. Brownie completely.

MR. STEER: And you are quite right.

Q MR. S. B. SMITH: And where is the control of International Utilities, is it in Calgary?

A I do not know where the control of International Utilities is, but I do know that about 30% of it is in Canada. If you think I am evading the question, the control is in the United States.

Q No, I am not suggesting that you are evading it at all. Now, Mr. Williamson, I take it that you are saying also in this submission of yours, assuming there is an exportable surplus, it should be used, after providing for the present and projected future requirements of Alberta, first for the benefit of other Canadian Provinces?

A Yes, we do say that.

Q And, therefore, you go on to suggest that if an all-Canadian route to Eastern Canada is not practical, that an exchange arrangement would be the most satisfactory method, I think you say ultimately, to supply the Eastern Canadian market. You do say that, I think, in effect, at pages 5 and 6?

A Where is that, Mr. Smith, please?

Q At the bottom of page 5 and the top of page 6?

A. H. Williamson,
Cr. Ex. by Mr. S. B. Smith

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A Yes, that is what we say.

Q That is correct?

A That is what we say.

Q Now, I suggest to you that the reason you advanced the view that the most satisfactory method ultimately to supply the Eastern Canadian market would be by an exchange arrangement between Canada and the U.S.A., is that such an arrangement, in effect, assures that Alberta gas is entirely used for Canadians, if you effect an exchange agreement which is sound. That is, if you send gas into the United States at one place, and you take a balancing amount back into Canada? The result eliminates transportation from here to Eastern Canada, as you suggest, and it is a means of transporting, in effect, Alberta gas into Ontario, isn't it?

A I think I could accept that.

Q Yes. And that is the ultimate means by which you suggest Alberta gas should be used for Canadians, or by Canadians?

A Well, our opinion . . .

Q Ultimately?

A Our opinion is that the gas, that we hope the Board will let us take out of Southern Alberta, will serve Winnipeg, Manitoba, and Saskatchewan, and that it will put a quantity into the Minneapolis Northern Natural Gas area, and that the City of Vancouver will be supplied by a northern route, and that gas will go out to Vancouver, to Seattle and Portland, and that the result of that will be that both the prairie market and the Vancouver market will be served, and that there will be gas going to the United States through Canada, and that in such a situation that the reciprocal return of gas to Ontario would be reasonable and proper.

A. H. Williamson,
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Q From the United States?

A Yes.

Q And you suggest that that might be accomplished ultimately?

A Yes.

Q But you have no proposal whereby United States gas, that is your Company, whereby United States gas would be furnished to any part of Canada, have you?

A Well, we think that if the Canadian gas went into the United States, and that some other company wanted to bring it in, that the two would not need to be tied together.

Q I am only saying that your Company has no such proposal?

A No, we have not.

Q And that exchange

A I think we can very readily get one.

Q Well, perhaps you can. That exchange arrangement, in your view, would be a beneficial arrangement as far as Alberta is concerned, and so far as Canada is concerned, would it not?

A I should think so.

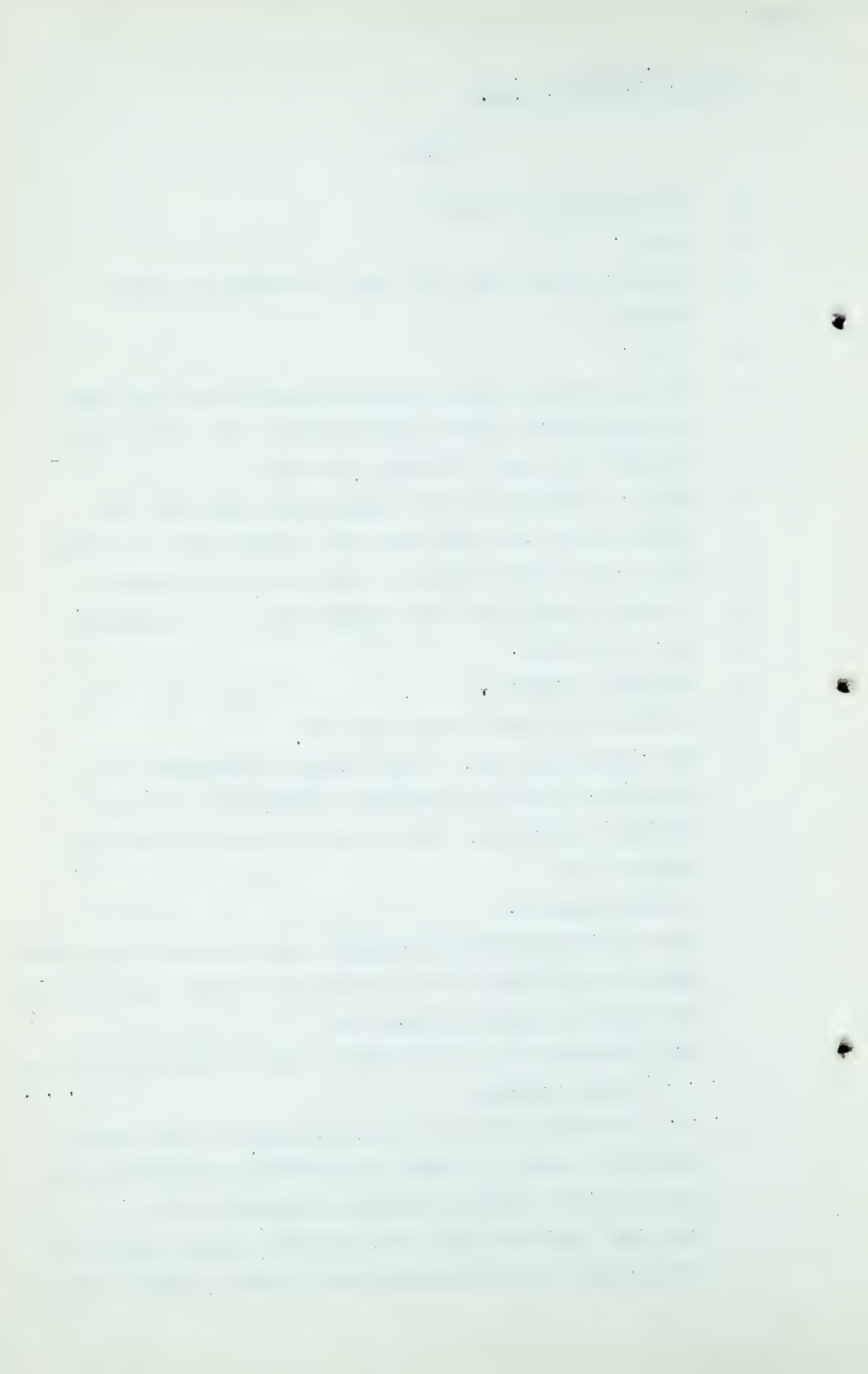
Q And if it is beneficial ultimately, the sooner you can accomplish it the better in the interests of Alberta and of Canada? That would be logical, wouldn't it?

A Yes, provided that in your haste to get it done you do not, . . .

Q . . . injure anybody?

A . . . take the gas out of Southern Alberta, so that there would not be any to go down to look after the Prairies, and when you don't need it in Southern Alberta, for B.C.

Q Now, your immediate plan is to take 150 million cubic feet per day into the United States and to sell 37 million cubic



A. H. Williamson,
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feet per day first on the Canadian Prairies?

A 100 million feet into the United States, sir.

Q Well. . .

MR. MARTLAND: 150.

Q MR. SMITH: Well, these exhibits have not been
gone into yet?

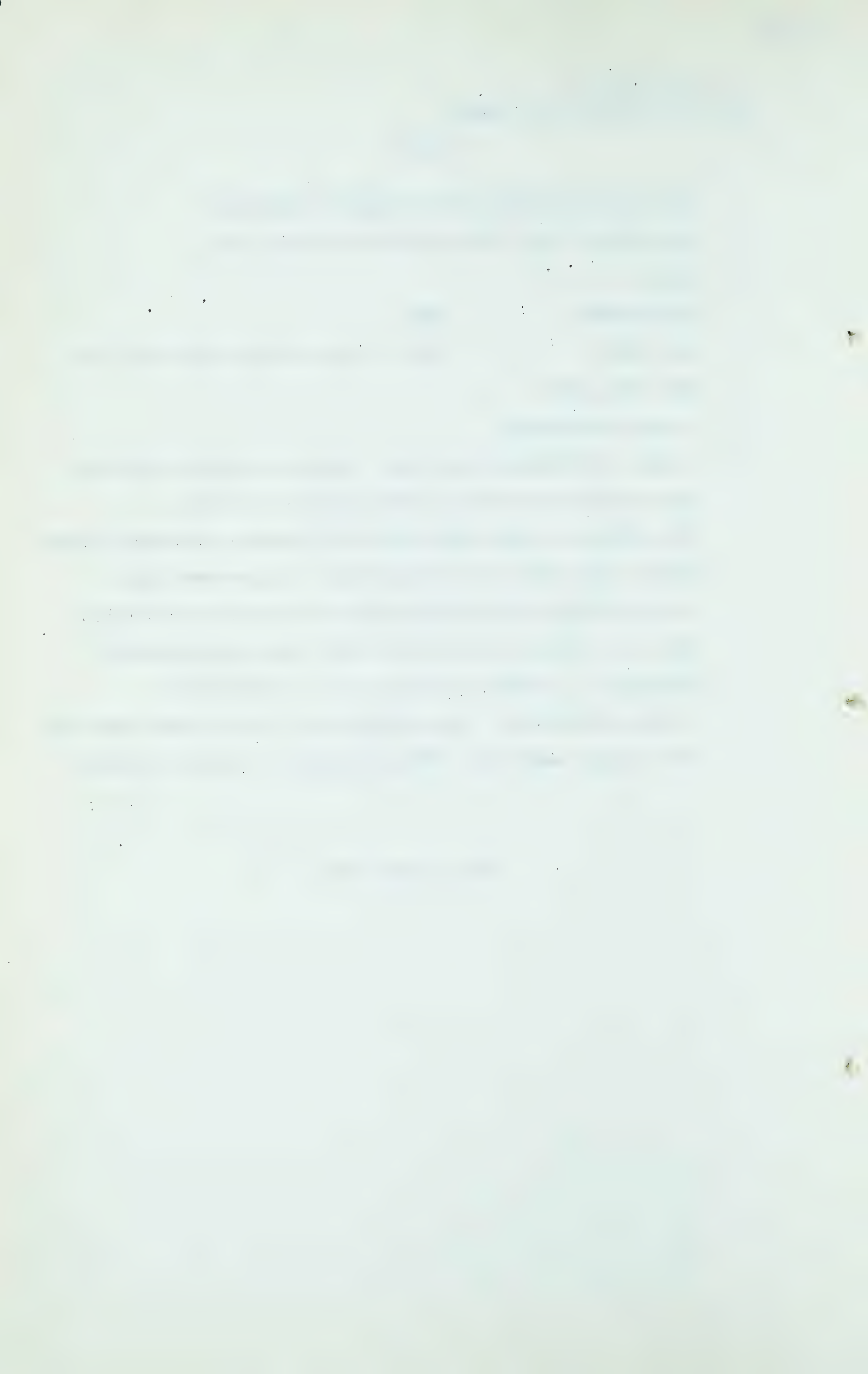
A I stand corrected.

Q I have the Western Pipe Lines' estimated markets and gas
requirements in my hand, and on page 1 it says,-

"In addition to the deliveries to be made to Canadian areas,
Western Pipe Lines has entered into an agreement with
Northern Natural Gas Company for the sale of 150 million
cubic feet of natural gas per day at the International
Boundary." Is that correct or is it 100 million?

A I stand corrected. I was referring to the minimum amount in
the contract which was 100 million, and I stand corrected.

(Go to page 2911)



A. H. Williamson,
Cr. Ex. by Mr. S. B. Smith.
Cr. Ex. by Mr. Macleod.

- 2911 -

Q So you are going to sell more than three-quarters of this gas in the United States. It is 150/187ths, is it not?

A I do not know. What are we now looking at?

Q I think we can find it. Mr. Nolan was asking you about Appendix 4, your estimated markets and gas requirements which show that your peak deliveries to the Northern Natural are 150 million cubic feet per day and your total sales 187,000,040. So that those are correct, apparently. Perhaps we can assume it is correct.

A One is the first year of operation and the other is the fifth year, is it not?

Q The first year of operation, and I am looking at the peak.

A Yes, sir.

Q Let us take the fifth year of operation, if you wish. 150 million for delivery to the Northern Natural and you are correct about this, the total is around 264,000,080?

A Yes.

Q So there you sell roughly . . .

A . . . about 60%, is it not?

Q 15/26ths.

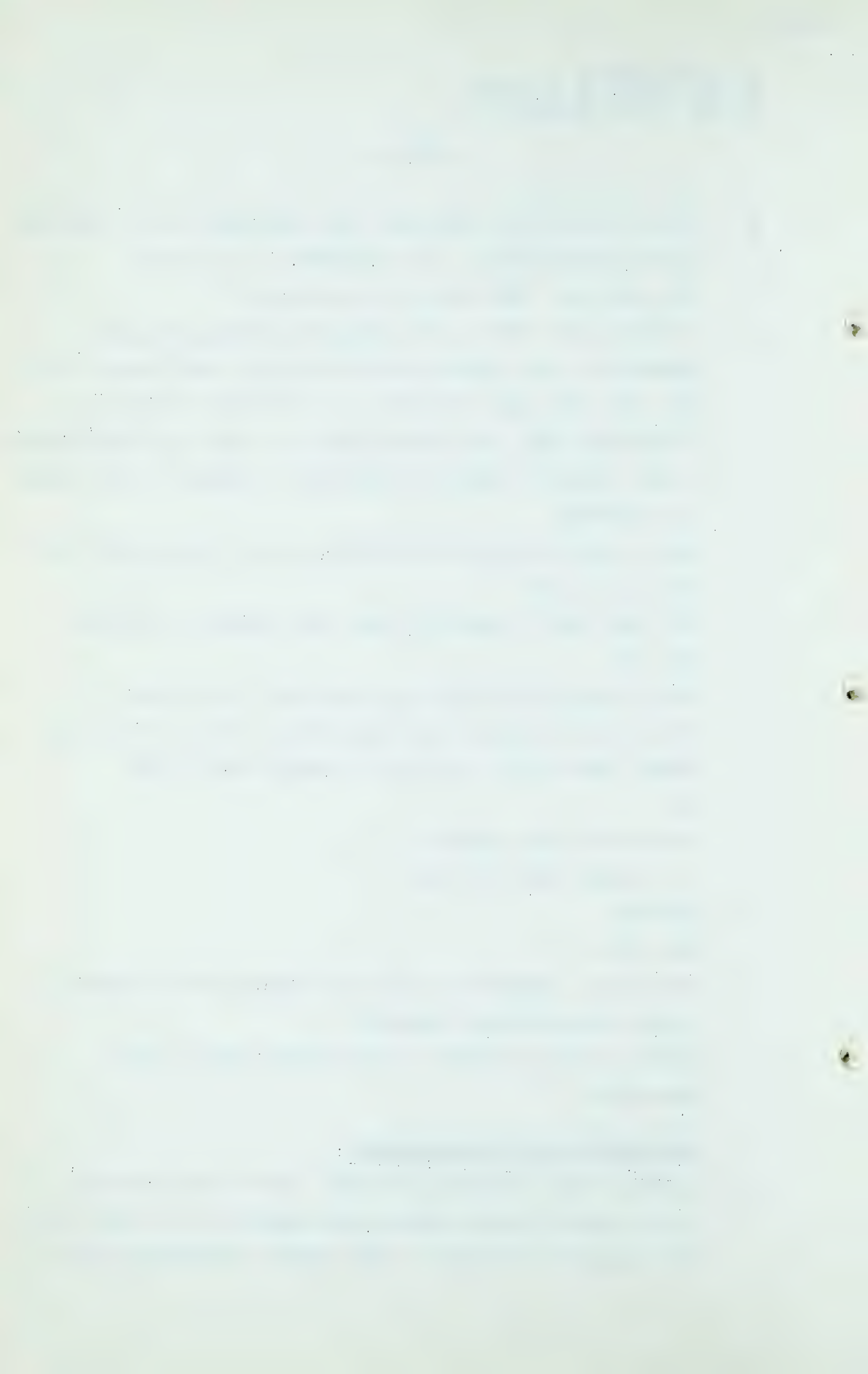
A About 60%.

Q You make no provision at all for bringing gas into Canada or into Ontario under this plan?

A We have no plan to submit at the present time in that connection.

CROSS-EXAMINATION BY MR. MACLEOD:

Q I gather from a perusal of document exhibit 103, as well as the answers you have made, particularly to Mr. Nolan, that the statements contained in this exhibit, excepting so far



A. H. Williamson,
Cr. Ex. by Mr. Macleod.

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as they relate to the composition of your company, are matters not within your own knowledge but are conclusions that are drawn not on any particular facts and you are not able to support them?

A I suppose a lot of it, shall I say, is my opinion for what it is worth based on discussions I have had with experts.

Q But anything to substantiate those opinions must be given in evidence by other witnesses?

A We have here what we think are very capable witnesses who will be much more satisfactory than I could be.

Q These statements are merely opinions based upon evidence which other witnesses will give?

A It is an attempt to outline what we hope other witnesses will demonstrate to the satisfaction of the Board.

Q There is one thing, there is one statement you make to the effect that you are a Canadian Company and that you are supplying gas to Canadian Provinces?

A Yes, sir.

Q Will you refer again to Appendix 4, which has already been referred to?

A Yes.

Q You notice there in the first year of operation you have a total of 53,238,900 Mcf?

A Yes, sir.

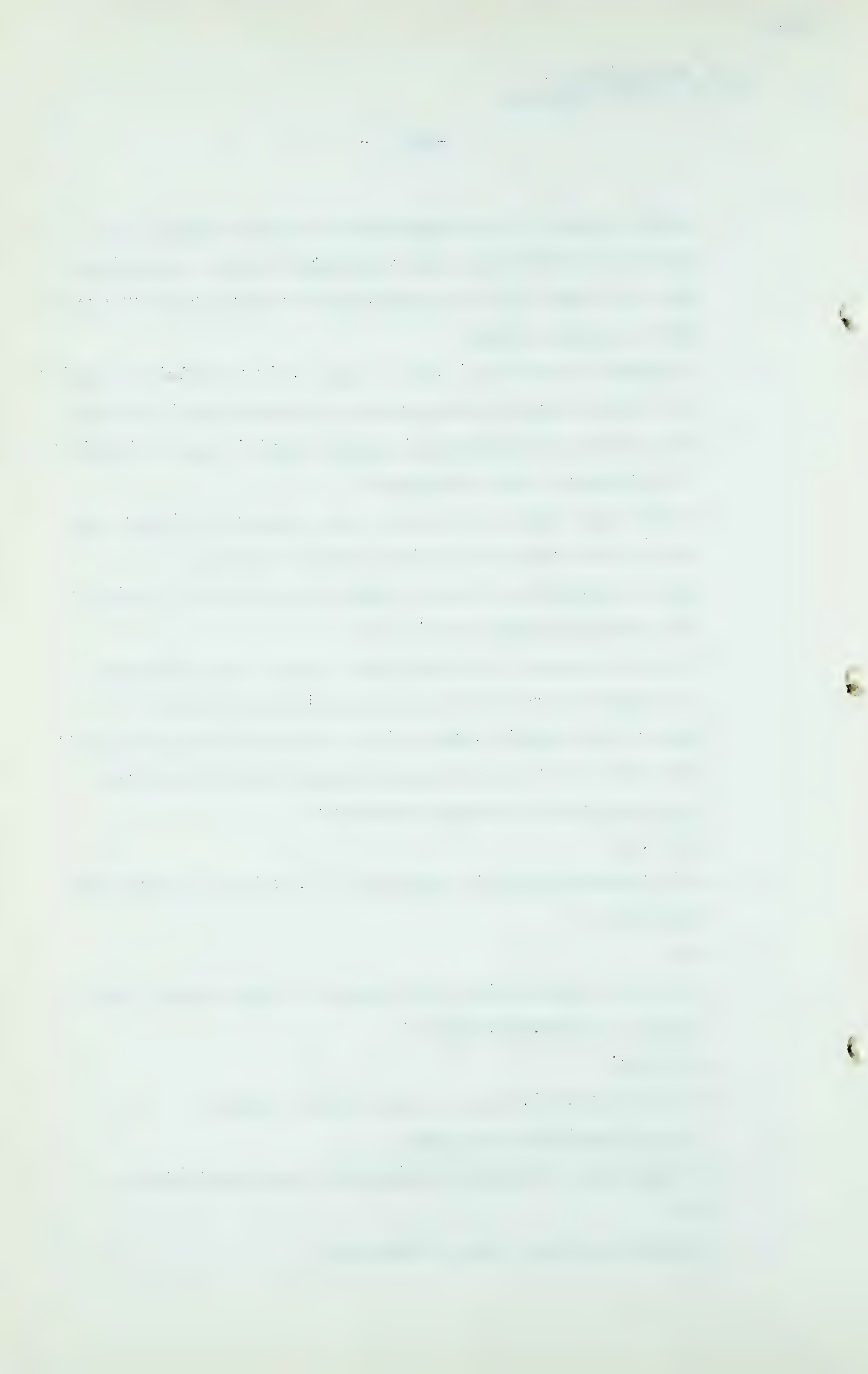
Q Of that 44,621,000 are to the Northern Natural?

A I cannot find where you are.

Q On Appendix 4, Estimated Markets and Gas Requirements.

A Yes.

Q Appendix 4, First Year of Operation.



A. H. Williamson,
Cr. Ex. by Mr. Macleod.

- 2913 -

A Yes.

Q So that you only supply that year to your Canadian market about 8,618,900 Mcf. That is the difference between the 44 and the 53? That is right?

A I suppose it is, sir.

Q And in your fifth year the corresponding figures are shown as 5,471,500 Mcf?

A Yes, sir.

Q That year you supply about 19 million to the Canadian market?

A Yes, about 20.

Q Can you tell me whether I am correct in this, that the average of the first four years based on this supply as of the first and the fifth is in the nature of 5,471,500, multiplying the sales over the last 16 years by 16, that you sell to the United States over a trillion, something in the nature of a trillion cubic feet. A trillion Mcf, while you are only selling to Canada . . .

MR. MARTLAND: Not Mcf.

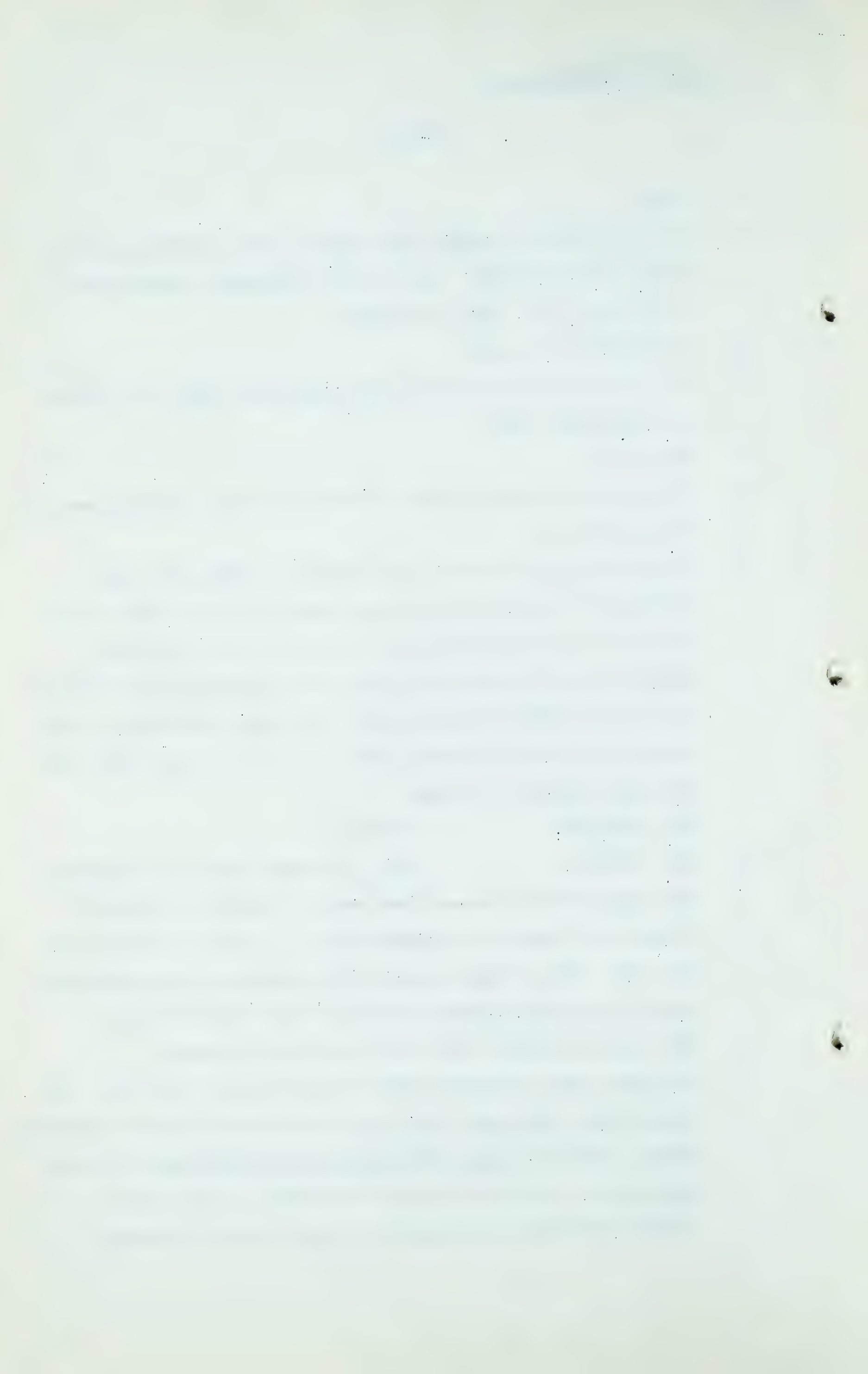
Q MR. MACLEOD: 370. In other words, you supply to the United States three times what you supply to Canada?

A I have not figured the figures here. I have the figures if you wish. But I shall accept the statement we are supplying in the early years three for one to the United States.

Q Yes, and you supply that for a total of 20 years.

A We figure that the market will be growing all the time. We in the first few years will have a system that has an immediate demand. We will supply Saskatchewan and Manitoba, but that takes quite a while to get all connected, as you know.

Q Is this fifth year supposed to be your normal procedure?



A. H. Williamson,
Cr. Ex. by Mr. Macleod.
Exam. by Mr. C. E. Smith.

- 2914 -

A I believe the experience in other systems has been that the demand grows even after 25 years and we hope to see a similar growth here.

Q This gas that you hope to get from Saskatchewan, it will also go to the United States?

A It would be part of the over-all supply.

Q The bulk would go to the United States. As a matter of fact, you supply more gas to the United States than any other applicant, do you not?

A I would not think so. I would imagine although I am not acquainted with the figures that the people who are going to go to Portland, and Seattle and such places as that, their percentage must be much higher in the United States.

Q I think the evidence is about 2 to 1 and yours is 3 to 1.

A I do not see how it could be so because the Prairie market is as big, or bigger, than Vancouver.

MR. C. E. SMITH: Just one question referring to page 5.

A Yes, sir.

Q The last paragraph, starting with the words "As an alternative. . . ." It is the paragraph about a third of the way up the page. I do not know whether it is the last paragraph but you see the words "As an alternative. . . . "?

A Page 5?

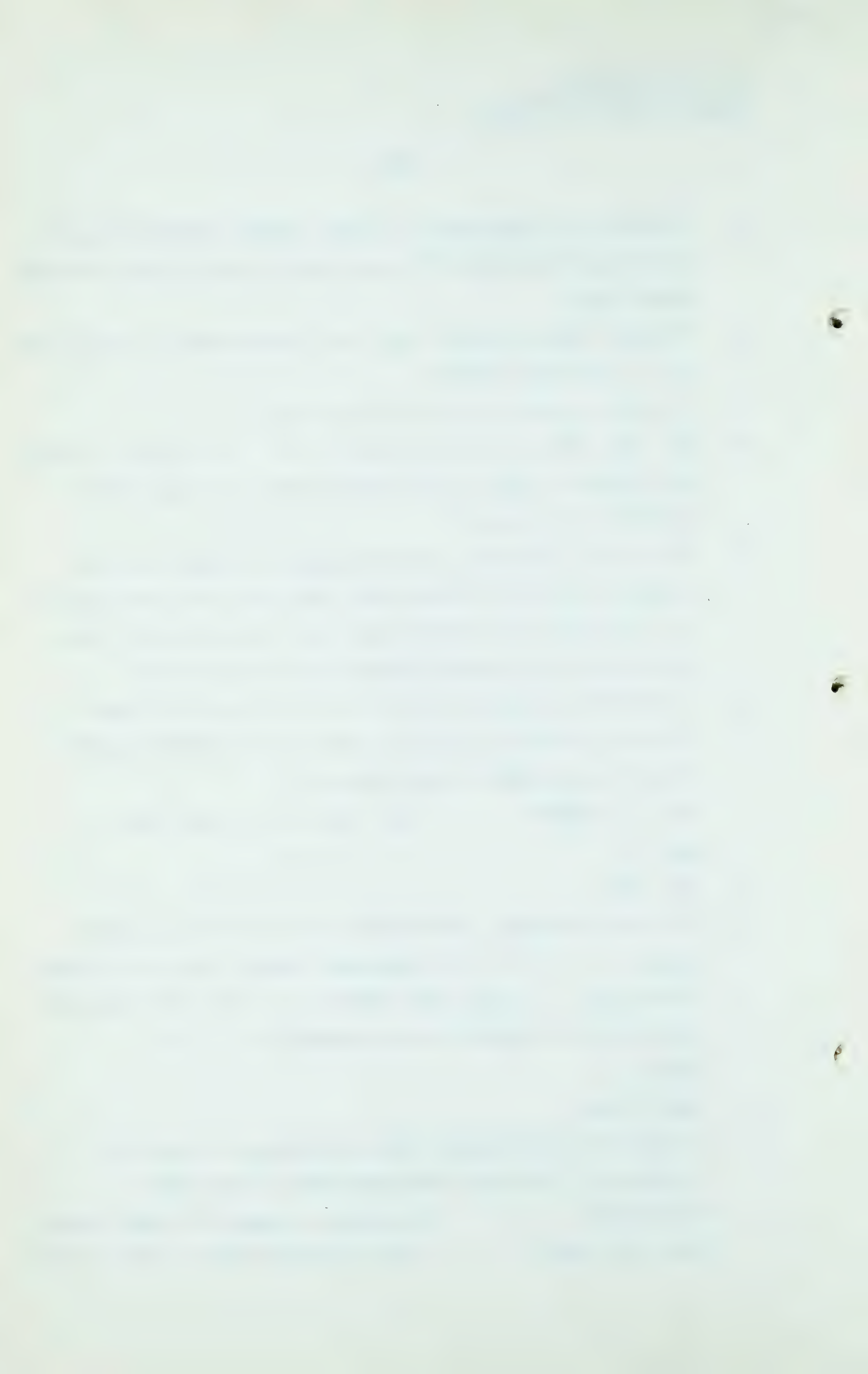
Q Page 5, yes.

A To provide an alternative means of supply, is that it?

Q I wonder if I have the same page number as you have?

DR. GOVIER: It appears on page 6 in some copies.

MR. C. E. SMITH: I was wondering what Mr. Bruce Smith



A. H. Williamson,
Exam. by Mr. C. E. Smith.

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was referring to. In your copy it is almost at the top of page 6?

A Yes.

Q No wonder I could not follow Mr. Bruce Smith. Now we both have the same place and the paragraph begins, "As an alternative Western could extend its line to or supply others wishing to supply Eastern Canada, if such a project could ever be demonstrated as economically possible." Has Western considered first an extension of its line to Eastern Canada?

A Yes, we have considered it.

Q And all you have done is come up with your opinion that it is not economically possible?

A It does not look so to us at present.

Q I am sorry Mr. Porter is not here. I mean, that is, what we can take from that is you do not think it is economically possible at present so that you have no plans, either tentatively or other wise for such a line?

A We do not think our opinion on such a subject is of much value but we put it in to indicate why we did not go the rest of the way in our plans.

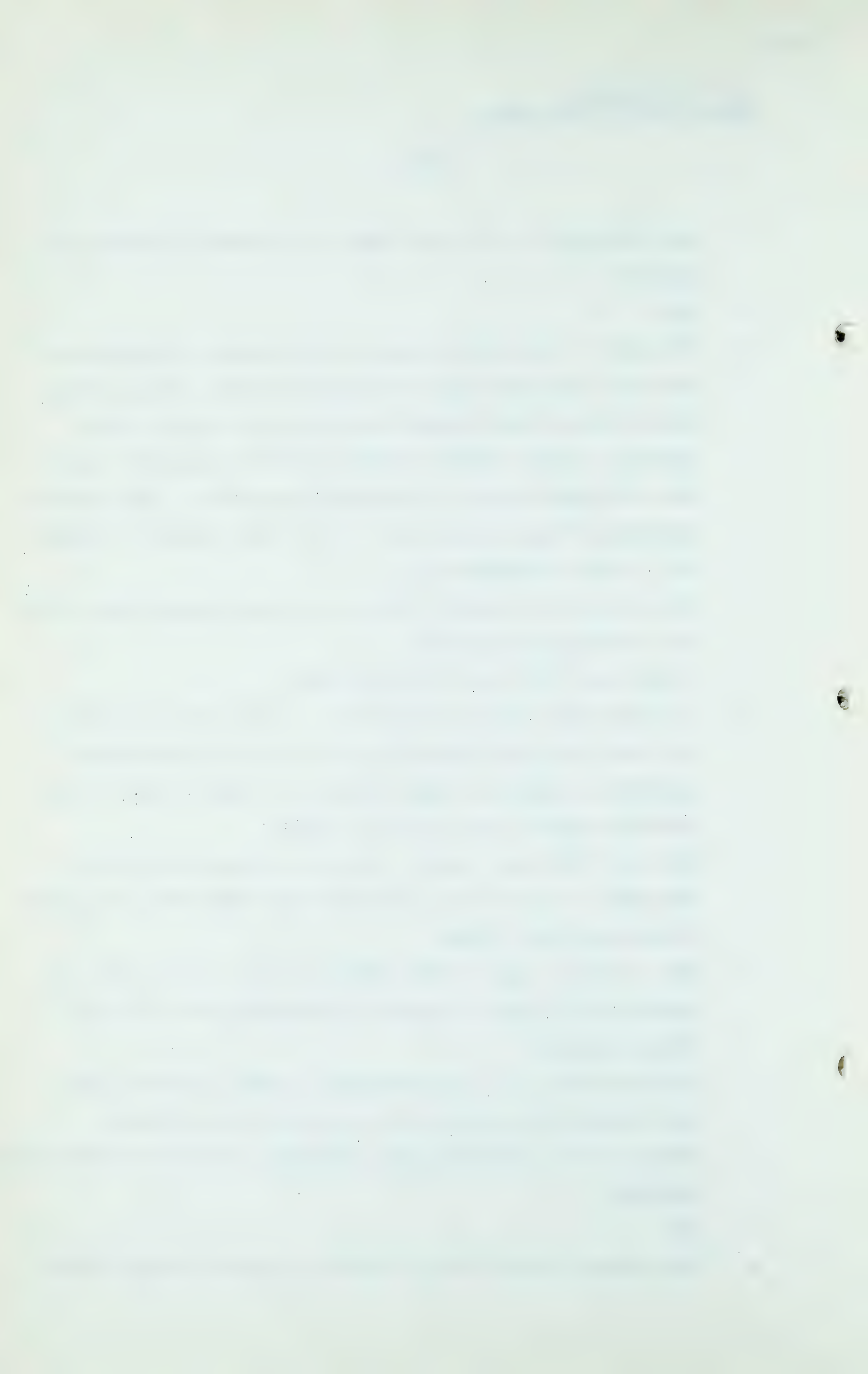
Q What I wanted to get at was whether or not you had gone any distance with plans in respect to extending your line to Eastern Canada?

A We have looked at it as something we might do but we have not included that as one of our objectives at present.

Q Because of the reason you have indicated, it is not economically possible?

A Yes.

Q With respect to this portion where you say you would supply



A. H. Williamson,
Exam. by Mr. C. E. Smith.
Cr. Ex. by Mr. Milvain.

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others wishing to supply Eastern Canada, just what did you have in mind there? Could you illustrate that?

A We had in mind if some of these gentlemen did produce large quantities of gas in Manitoba and Saskatchewan, and we had a line going to Winnipeg, and it was well on its way to Eastern Canada in such circumstances the gas was cheaper because they did not have to take it all the way and we would either then take it down ourselves if we could, or if we could not, make arrangements with someone else to take it down there.

Q In other words if somebody else takes it further on than Winnipeg to Eastern Canada, you will either join them or sell to them?

A That is exactly what we have in mind. We intend to do everything we can to develop a market for Alberta gas particularly and keep our line going.

Q That is all. I wanted to make sure that is what you did have in mind.

CROSS-EXAMINATION BY MR. MILVAIN:

Q Just one or two questions. Would you look at page 7 of the contract that was filed, marked Exhibit 104?

A I am going to be back in trouble again, I can see that. Page 7?

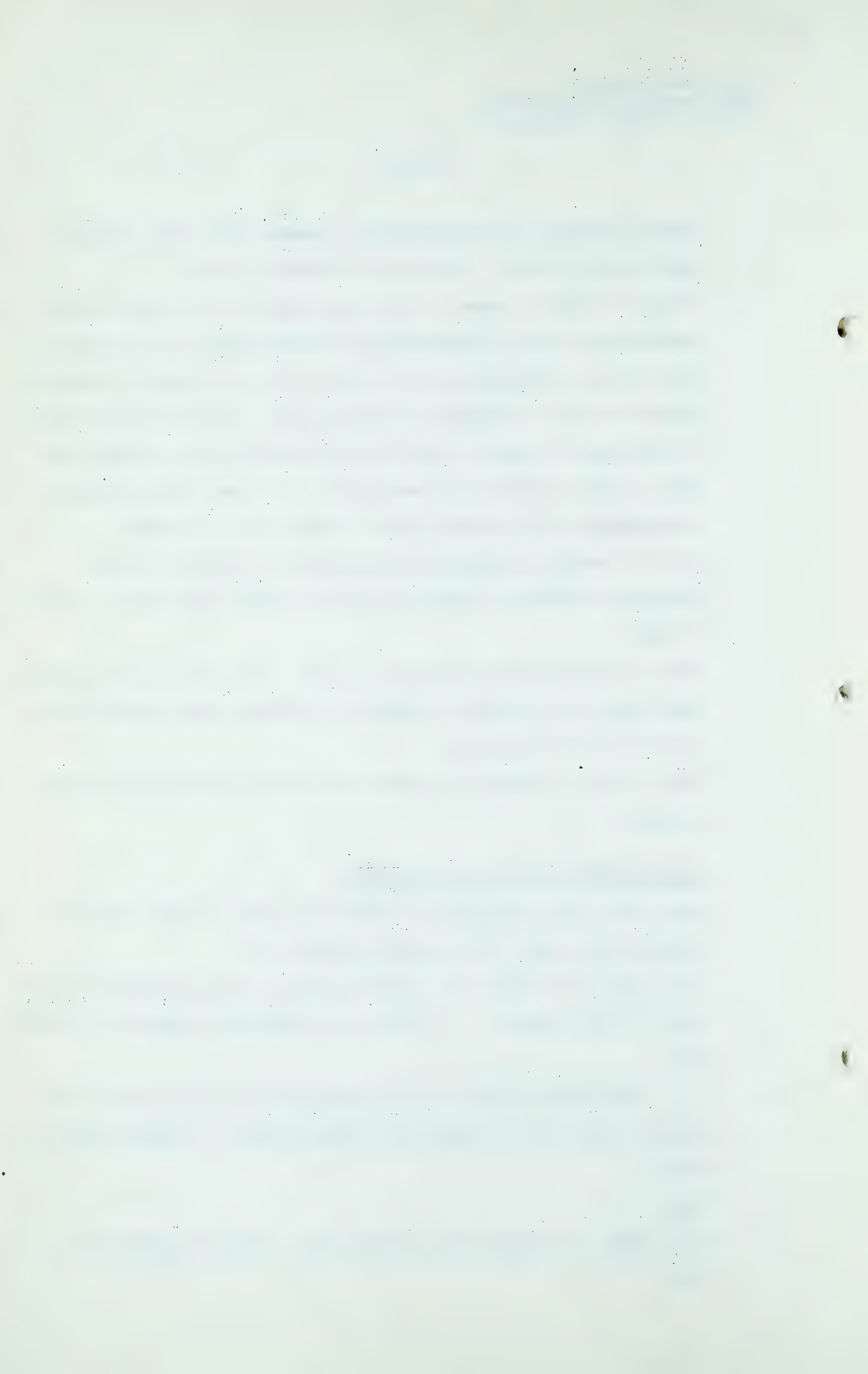
Q Yes, Mr. Williamson. I notice in paragraph numbered 2(f)(9).

A Yes.

Q . . . reference is made to the development of the use of the taconite ore in the Mesabi Iron Range area of Northern Minnesota?

A Yes.

Q Am I right in saying that taconite is a very low-grade iron ore?



A. H. Williamson,
Cr. Ex. by Mr. Milvain.

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A Well, I believe so. The President of the Northern Natural Gas Company is here and he is an expert on such subjects.

Q I understand it is a very low-grade ore, and I think you will agree with me on that. I suppose that the only service that gas would be in that ore would be perhaps to make it cheaper to work that ore.

A Well, I would speculate with you on that. I am certain that is so.

Q I suppose it is thought it might be a cheaper form of fuel that could be used in making that ore available for commercial use?

A I have heard without a cheaper fuel it will be impossible to develop that ore.

Q I suppose you are aware, too, Mr. Williamson, that the Canadian Government is spending a lot of money in seeking to develop iron ores in Canada?

A I did not know the Canadian Government were spending any.

Q Let us say at least favoring the development of iron ore deposits in Northern Ontario and Northern Quebec.

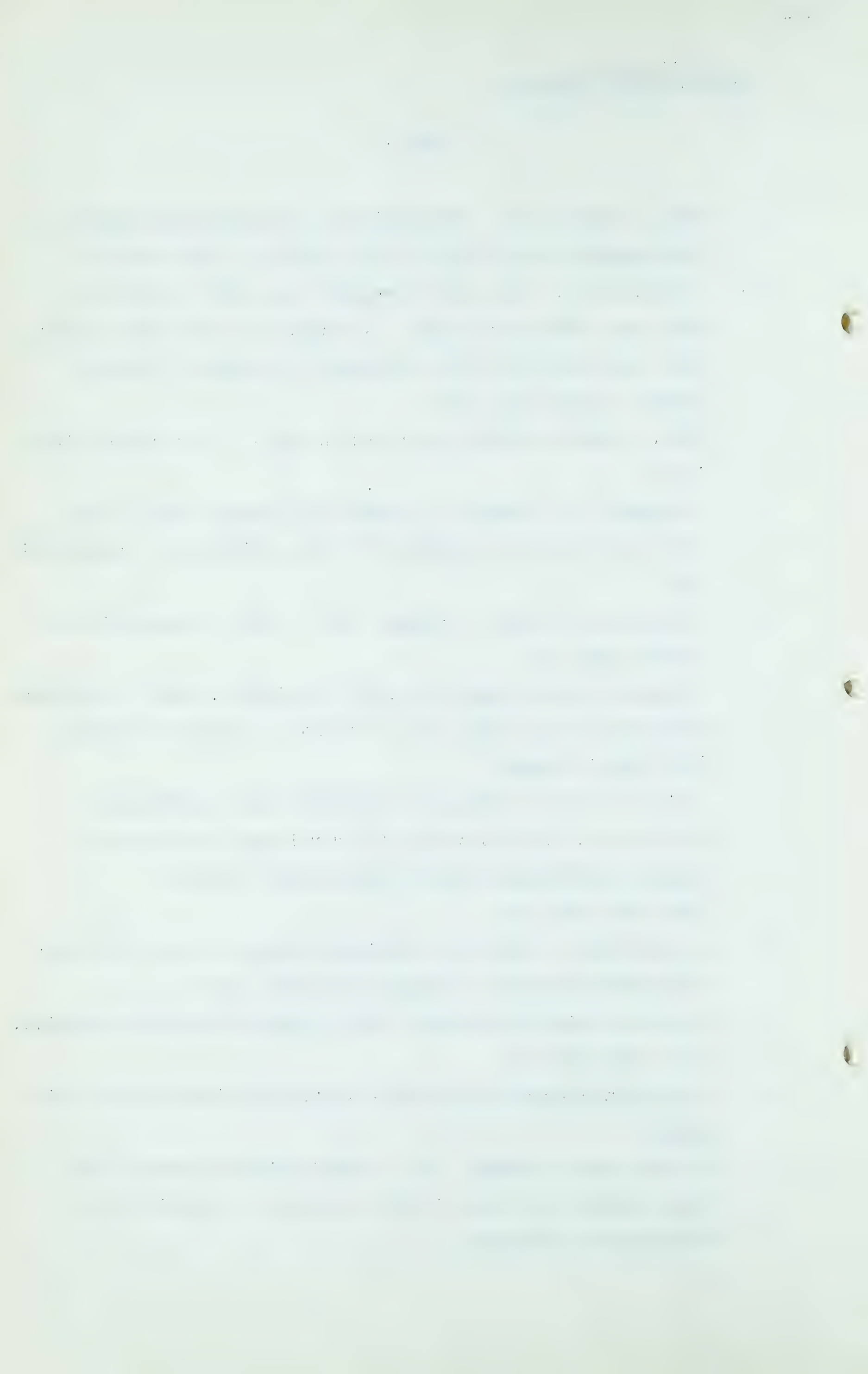
A I am sure they are.

Q Do you think it would be a desirable thing to have this cheap ore in Minnesota put in competition with ours?

A It is not going to be cheap. It is going to be very expensive, as I understand it.

Q The gas will probably make it a little bit cheaper than it is anyway?

A It will make it usable. But I would think we want all the steel supply we can get in North America in the kind of a world we are living in.



A. H. Williamson,
Cr. ex. by Mr. Milvain.

- 2918 -

Q Do you think that it would be useful from a Canadian point of view?

A Yes, indeed, I do.

Q To make this Minnesota iron ore competitive on the market with our own?

A Yes. I think we should help them to develop it, if we can. They are developing ours.

Q If that is your view, all right. There was one other thing that I noticed when you were answering my friend Mr. Smith. You made a statement to the effect that it was not economically feasible to transport gas into Eastern Canada?

A That was our opinion, yes.

Q Is that due to the fact that there is a shortage of gas or you cannot meet the competitive prices?

A Our opinion was both those factors were concerned in the difficulties.

Q The available known supplies of gas were insufficient to meet such a demand?

A That was our feeling.

Q And also that in getting it there it would be very expensive and it would not be able to compete with competing fuels?

A We feared that would be so.

THE CHAIRMAN: That will be all, thanks. We will adjourn until 2 o'clock.

.....

R. E. Grose,
Dir. Ex. by Mr. Martland.

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2 P.M. SESSION

MR. MARTLAND: There is present, sir, a representative from the Manitoba Government, Mr. R.E. Grose, Assistant Deputy Minister, Department of Industries and Commerce, who has a very short statement which he would like to make, sir.

R. E. GROSE, having been
first duly sworn, examined by Mr. Martland, testified as follows:

Q Mr. Grose, you are the Assistant Deputy Minister, Department of Industries and Commerce for the Government of Manitoba?

A Yes, sir.

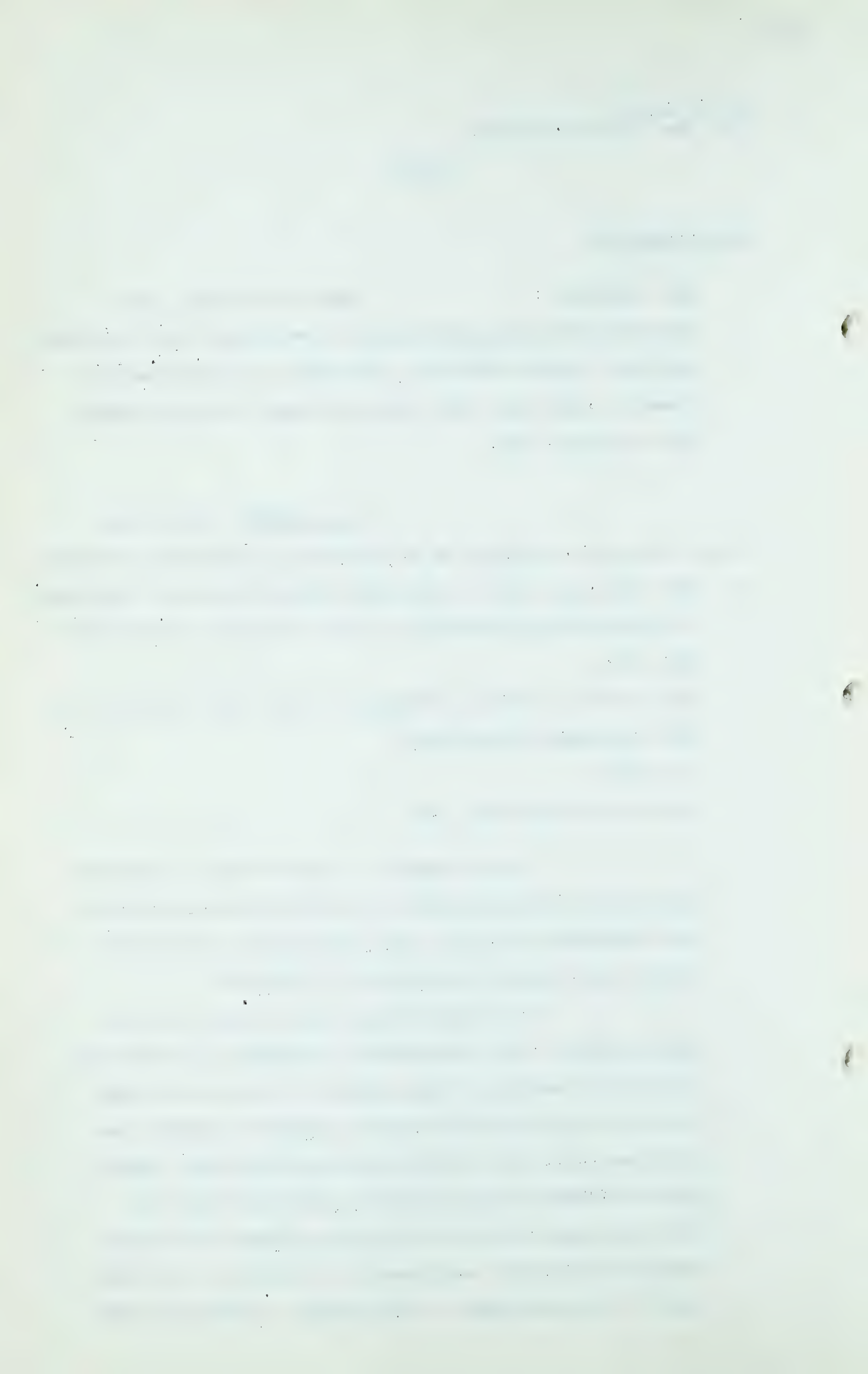
Q And you wish to make a statement to the Board on behalf of the Government of Manitoba?

A I do, sir.

Q Would you do that now, sir.

A The Government of the Province of Manitoba appreciates this opportunity of making representations to your Commission regarding the transmission and sale of natural gas outside the Province of Alberta.

It is appreciated that it has been the stated policy of the Government of Alberta to protect the interest and welfare of the people of your province and to refuse any application for the export of natural gas until such time as your Board was satisfied that under sound conservation and proration practices there are sufficient gas reserves to meet the present and future domestic industrial requirements of Alberta. It is the hope of the Government of the Province of Manitoba that



R. E. Grose,
Dir. Ex. by Mr. Martland.

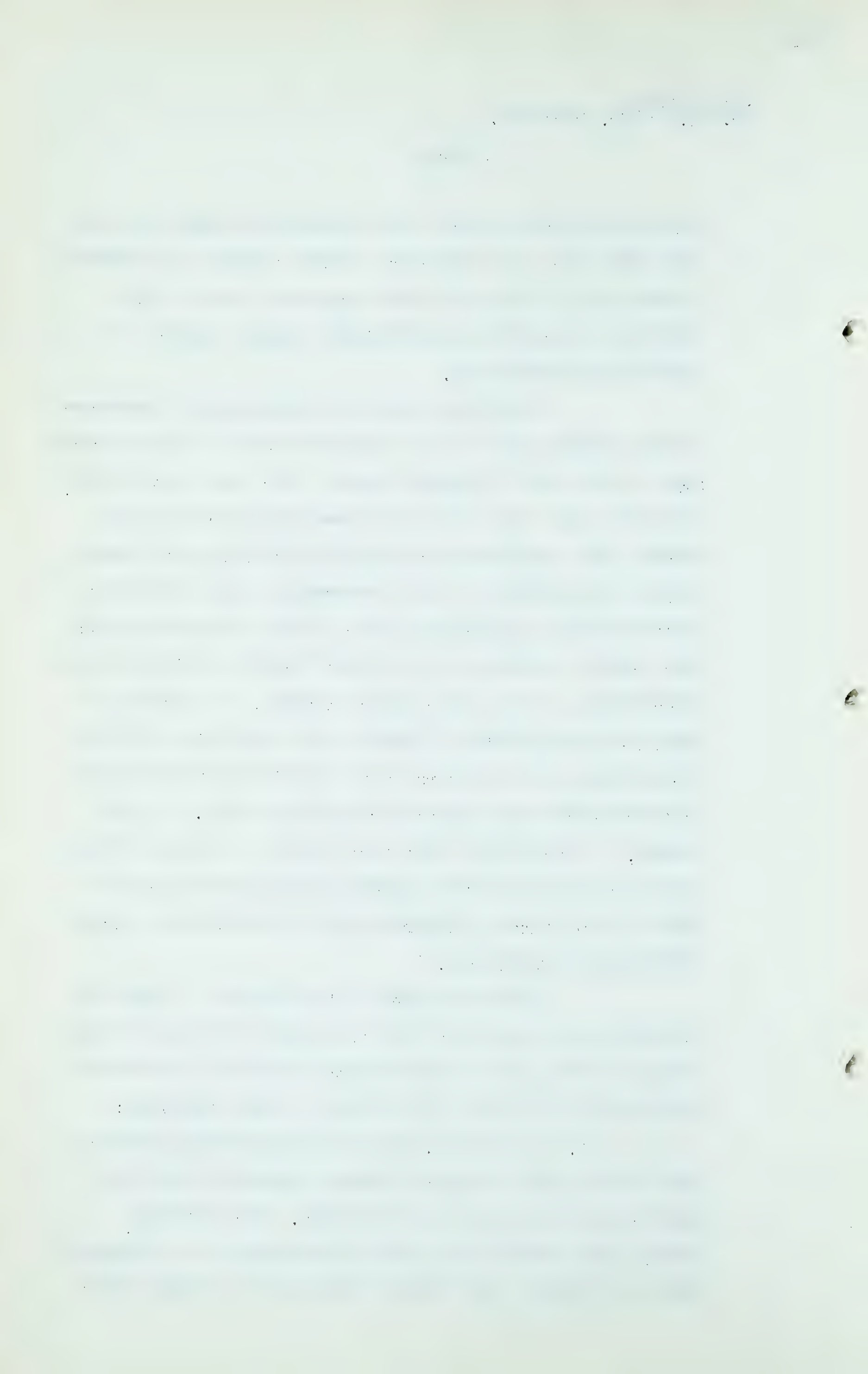
- 2920 -

the Petroleum and Natural Gas Conservation Board will now find that there are sufficient proven natural gas reserves to meet all of the present and projected needs of the Province of Alberta and sufficient surplus reserves to justify its exportation.

Source of heat is of fundamental importance to the economic life of any region and this is particularly true in the case of Western Canada. For that reason it is sincerely hoped that when this Commission decides that natural gas from Alberta can be made available for export outside the province it will recommend to the Government of the Province of Alberta that a policy be adopted which will ensure consumers in the other Prairie Provinces being served ahead of all other export markets. By building a pipeline from Alberta to Winnipeg that objective could be accomplished and consumers in the heavily populated areas of Saskatchewan and Manitoba receive priority. In this regard, it is believed that there exists in Western Canada large potential consumer demands and that these requirements should form an integral part of the eventual markets for Alberta natural gas.

The Government of the Province of Manitoba in making the suggestion that the people of Western Canada should receive first consideration in the use of natural gas from Alberta base their opinion on the following:

1. Geography, distance and physical barriers have created five separate economic areas in Canada and the Prairie Provinces is one of them. Each of these areas tends toward unity within itself and it is essential that we integrate our natural resources in a manner that



R. E. Grose,
Dir. Ex. by Mr. Martland.

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will make a maximum contribution to the stability of the economy of Western Canada.

2. The Prairie Provinces, from bitter experience, are fully aware of the disadvantages of a "one industry" area. It is recognized that the prosperity of all three Western Provinces is very closely linked, and that conditions that affect any one of the Prairie Provinces affects the economy of Western Canada. For this reason it is essential that steps be taken to stimulate and encourage industrial development in Western Canada in order to relieve our heavy dependence upon agriculture and to create a more balanced economy. In addition, of course, it is in the national interest to encourage as widespread a distribution of industry as the natural resources of the country will permit. This is particularly true in the Prairie Provinces, in view of their geographic characteristics and scattered population areas.

3. The availability of natural gas can play an important part in the further growth and diversification of industry within the region. It will be an added inducement to industrial enterprises which might be drawn to the Prairie Provinces by such other factors as the abundance of raw materials and labor and the growth of the Western Canadian market. It is generally recognized that with the exception of a relatively few specialized industries, natural gas alone rarely determines the location of an industrial plant but that the availability of gas along with other advantages can result in a very economical combination. In other words, the availability of natural gas at economical rates will facilitate the

R. E. Grose,
Dir. Ex. by Mr. Martland,
Cr. Ex. by Mr. S.B. Smith.

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introduction or expansion of many different industries whose growth in the region is economically feasible. Finally, it can result in a faster rate of general industrial growth for the whole region which is of great importance to the sound, well-rounded growth of the region's industrial economy.

4. The export of natural gas from Alberta to the other Prairie Provinces will assist in the creation of those conditions which will permit the two remaining provinces to use their domestic resources to the full. This will in turn assist Alberta, because it is an accepted general principle that territorial specialization, permitting regions to produce those commodities which their resources are capable of producing most effectively, raises the standard of living of the people of the whole area.

5. The Prairie Provinces have, in the past, co-operated in matters of mutual interest, and it is hoped that in the question of the use of natural gas, this co-operation will be continued and extended in every practical direction. Such co-operation at this time will greatly assist in the development of employment opportunities and the full utilization of the production facilities of Western Canada.

Q Thanks. Will you answer any questions that are put to you?

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Mr. Grose, you are rather advancing a Serve Canada first policy, perhaps briefly describing it in respect of the

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export and use of Alberta gas?

A I do, sir.

Q Before exporting to the United States?

A As a representative of the Province of Manitoba, I am afraid I have to restrict my remarks to that Province. We are suggesting to this Board that if they find there is sufficient gas to justify exportation that a preference be given to Western Canada.

Q Before export to the United States?

A Yes, sir.

Q And the company whose evidence we are hearing at the moment, Western Pipe Lines, is one of the companies that proposes to take gas into Manitoba, you are aware of that fact?

A Yes, sir.

Q You have seen their briefs and discussed the matter with them?

A No, sir. I have been here for two days, though.

Q You have heard their evidence and Mr. Williamson's presentation this morning?

A Yes, sir.

Q You heard Mr. Williamson say this morning, I think I quote him correctly, when he said that it was impossible for Western Pipe Lines to take gas to Manitoba without exporting gas into the United States, in his opinion?

A I see. I do not quite remember him saying that but I will accept that.

Q And according to my calculations, on their fifth year of 74 billion cubic feet they propose to export 54 billion to the United States, which, according to my calculations, is 74 per cent of their load. You heard those figures

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discussed, I think, this morning?

A Yes, sir.

THE CHAIRMAN:

That is all. Thank you,

Mr. Grose.

MR. MARTLAND:

Mr. Harris will be presenting
a brief on Market Requirements of Greater Winnipeg, and I
would like to tender a copy of that, sir, as an exhibit.

BRIEF OF WINNIPEG ELECTRIC
COMPANY, "MARKET REQUIRE-
MENTS OF GREATER WINNIPEG"
PUT IN AND MARKED EXHIBIT
No. 105.

A. H. HARRIS, JUNIOR, having
been first duly sworn, examined by Mr. Martland, testified as
follows:

Q Mr. Harris, you are the manager of the Gas Utility of
Winnipeg Electric Company?

A That is correct, sir.

Q And how long have you occupied that office?

A Approximately fourteen years.

Q And you are a graduate in mechanical engineering?

A Yes, sir.

Q From where?

A Stevens Institute of Technology, Hoboken, New Jersey.

Q Well, now, just tell us your experience in the coke and
gas business down to the time you joined the Winnipeg
Electric Company?

A I joined the Providence-Rhode Island Gas Company in 1913.
I was there approximately two years and went to Joliet,
Illinois, as superintendent of the Coal Products Manu-

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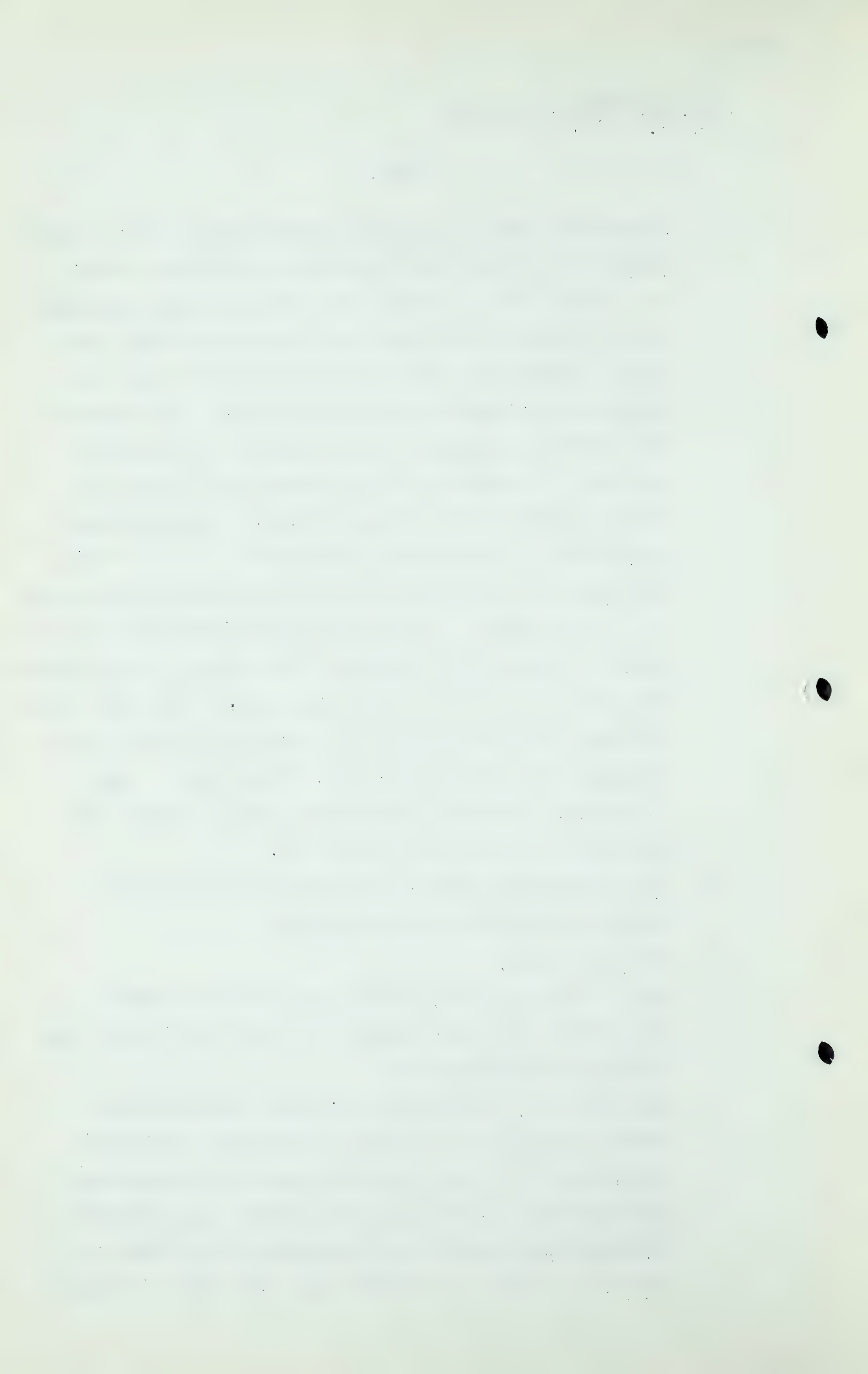
facturing Company, which was the gas supply, the only gas supply for the Western United Gas and Electric Company, in 1915 to 1920. In 1920 I went with the then Lackawanna Steel Company as Assistant Superintendent of their coke plant in Lackawanna outside of Buffalo, New York, and became Superintendent the following year. This company was absorbed by Bethlehem Steel Company in the fall of 1922 and I continued in that capacity until joining the Coppers Company of Pittsburgh in 1929. Coppers Company specialized in construction and operation of by-product coke oven and gas plants and practically everything having to do with that. I was with them in Pittsburgh for two years in charge of the Chicago office and in the engineering and construction division for six years, in New York following that for approximately two years in the Coppers Coal Company in the sales department. From there I came to Winnipeg to originally investigate the gas utility and was asked to stay on and operate it.

Q And the Winnipeg Electric Company has for some years operated a manufacturing gas utility?

A Yes, they have.

Q And is your company, the Winnipeg Electric Company, interested in the development of a market for natural gas in Winnipeg and vicinity?

A Very much so. Our present production facilities are reaching the end of a long and useful life. Their reproduction on a scale comparable with our present output would require such an expenditure that I do not believe we could show any return to an operation of that size. We are very anxious to get natural gas, not only to replace



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our present equipment but to greatly expand our market, which I am really quite certain after some considerable investigation is ready and waiting for natural gas in Winnipeg.

Q Now, have you a personal knowledge of the potential market in Winnipeg for natural gas?

A To a great extent, not in absolute detail but some of my men have been involved along with Stone & Webster in helping the development of potential markets and I agree thoroughly with their findings.

Q And did you prepare this exhibit along with your assistants which has now been marked Exhibit 105?

A I did.

Q I wonder if you would now deal with the exhibit, Mr. Harris, and we want to highlight it as far as possible but there may be, and there will be, portions which you will want to read in full.

A I will do that, sir. By way of explanation, the object of this brief, Mr. Chairman, was to first establish the fact that Winnipeg is a city and is a community of greater -- Winnipeg really does exist, that it is a potential market for natural gas, that it necessarily involves considerable statistics which I will endeavour to highlight as much as possible.

PROVINCE OF MANITOBA

<u>POPULATION</u> - D.B.S. gives 1946 census	-	726,923
D.B.S. estimate, June 1, 1950	-	795,000

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GREATER WINNIPEG INCLUDES:

Cities of Winnipeg and St. Boniface
Municipalities of East Kildonan
St. James
Fort Garry
North Kildonan
St. Vital and
West Kildonan.
Towns of Tuxedo and Brooklands.

I may add that this report was originally prepared a year ago. Since then additional statistics up to date have been prepared and are given in the supplement, but as I read those figures it may differ from the printed text and they will be the later figures.

POPULATION - 373,012 - Estimate, Henderson's Directory,
Dec. 31, 1949.

EFFECTIVE BUYING INCOME (Sales Manager Estimate 1959)

Gross	-	\$265,789,000
Per capita		1,121
Per family		3,759

NATURAL RESOURCES AND RAW MATERIALS:

Manitoba is primarily an agricultural province, much of it being influenced by the rich clay loam with an alluvial silt top soil located in the Red River and Assiniboine valleys and drainage areas. Its principal grain crops are wheat, oats, barley and flax, and there is considerable market gardening industry adjacent to large urban domestic centres and the source of vegetables for canning and food industries. Large dairy herds from nearby farming districts form the major source of the Metropolitan fluid milk supply for domestic consumption and ice-cream manufacturing.

Raw materials from every part of the Province, as well as from outside its borders, are the basis of a varied industrial and processing industry. Basic materials

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close at hand include sand, gravel, clay, lime, gypsum and the famous Tyndall limestone for the building and construction industry. Bentonite clay, an important bleach and clarifying agent in oil refining and a filtering agent in the packing house industry, is produced in Southern Manitoba and refined in Winnipeg. The Metropolitan fur garment industry draws upon skins produced, dressed and dyed within the Province for fur coats and jackets that are sold through the continent.

Secondary resources from several basic industries are the source of raw and processed materials for many secondary allied industries. Breweries depend upon the local malting industry for malt produced from Manitoba malt barley. Bakery products and confections have a handy source of sugar from the nearby sugar refinery operating on Manitoba produced sugar beets. Stock food processors utilize the by-products of vegetable oil processing, the vegetable oil itself being a main ingredient of such local products as salad oil and margarine. A large size paper company utilizes Manitoba's vast pulp forests to produce the paper and paper-board used in the printing, publishing and paper company industries of Greater Winnipeg.

PRESENT INDUSTRY

From a small beginning some 50 or 60 years ago, industry in the Metropolitan area has flourished and developed until today there are approximately 1,300 manufacturing and processing establishments producing a large variety of commodities. In addition, several large wholesale houses handling hardware, groceries, farm

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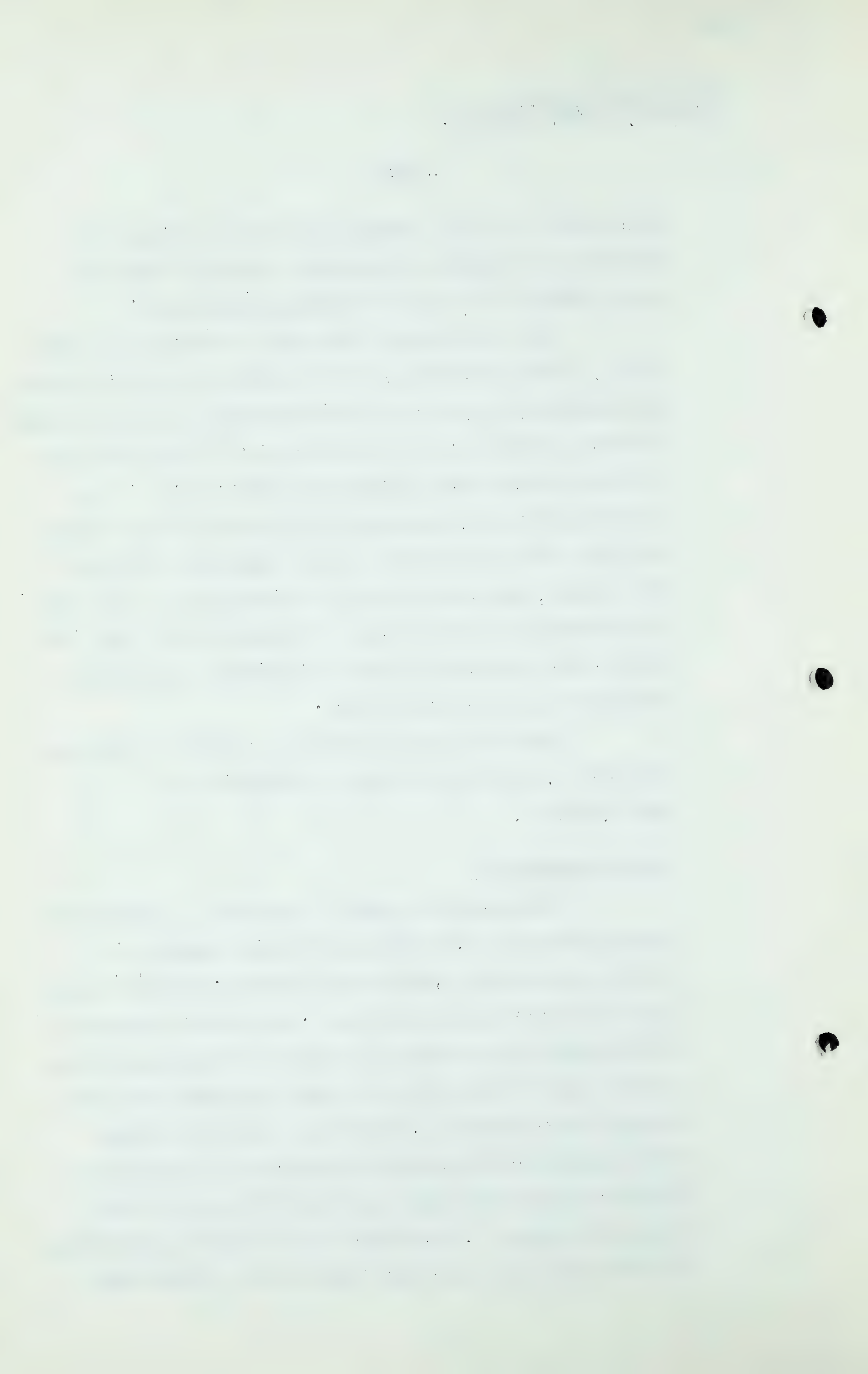
machinery, and other products used in both Rural and Metropolitan districts throughout the entire West are among Greater Winnipeg's flourishing businesses.

The population of Manitoba is 795,000 approximately. Greater Winnipeg, with its 368,100 people, supplies approximately 80 per cent of the manufactured and processed products produced within the Province. In 1949 the value of these products was estimated at \$525,000,000. The following Table A, including all industries in the Metropolitan area employing 15 or more employees, indicates the extent, type, and variety of utilization in this area, together with the gross value of production for 1947, the latest year for which figures are available (authority - Dominion Bureau of Statistics).

The last figure on Table A, and this covers the year 1947, is the gross value of production of \$306,993,899.

POWER CONSUMPTION

Hydro-electric power is supplied to the area by two organizations, the Winnipeg Electric Company, a private corporation, and the City Hydro, a publicly owned utility of the City of Winnipeg. Five plants located on the Winnipeg River within a 100 miles of Winnipeg are the entire source of the electric energy consumed within the Metropolitan district. In addition, there is a large Rural electrification system operated by the Province of Manitoba which draws upon the Private Utility for its source of supply. The Province has now under construction an additional hydro-electric plant at Pine Falls which



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will use the same Winnipeg River source of water power after it passes through the turbo generators of the two companies mentioned above.

Power production facilities have been kept well in advance of industrial and commercial requirements, although statements have been made by presumably well-informed people that additional power sources will have to be made available in this district within a few years if its natural growth is not to be impeded. The cost of present hydro-electric power for industrial and commercial use in the Metropolitan area is among the lowest in Canada.

The following table gives the installed horse power ratings of the various electric generating plants involved.

TABLE B

Installed Horsepower Capacities

Winnipeg Electric Company

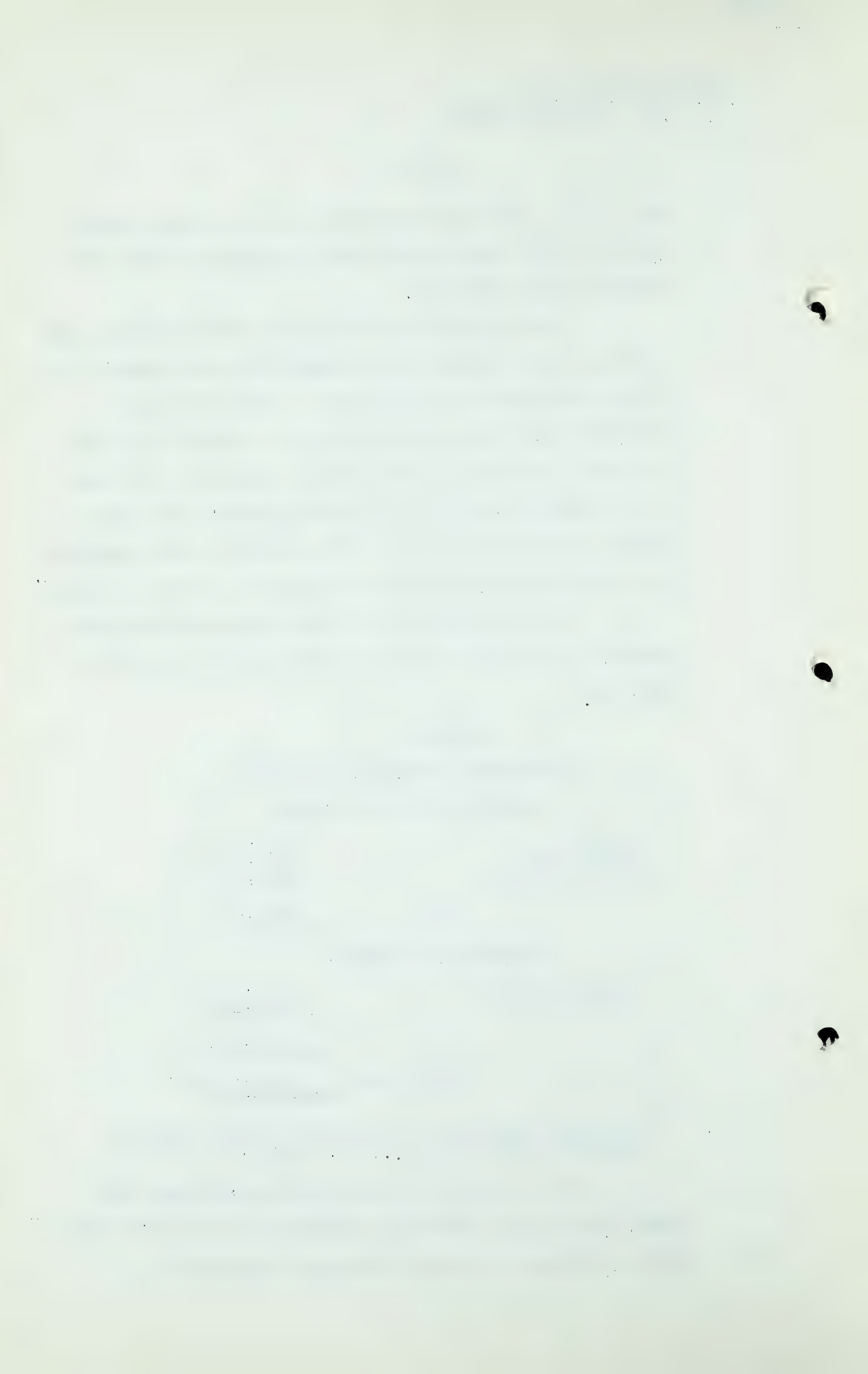
Pinawa	30,000	hp
Great Falls	168,000	hp
* Seven Sisters	187,500	hp
Total	385,500	hp

Winnipeg City Hydro

Pointe du Bois	105,000	hp
Slave Falls	96,000	hp
Total	201,000	hp
Grand Total	586,500	hp

* Ultimate capacity of Winnipeg Electric Company's
Seven Sisters Plant,..... 225,000 hp

Since this report was written, New Pine Falls plant, built by the Province of Manitoba of 100,000 horsepower, I believe, is about to go into production.



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Approximately 20% of the total power generated with the present plants is secondary power, mostly used for steam-generating purposes by the paper mills, mines, packing companies and other large steam users, and is sold at a very low rate. As the demand for firm power increases, natural gas will be the logical substitute for much of the secondary power that can be taken to supply the needs of the firm power customers.

The following Table C shows the total power consumption of the Metropolitan district for the past few years. It gives a total of 1,304,671,730 kilowatt hours in 1949, and in 1950 that increased approximately 75 million kilowatt hours for a total of 1,377,810,712.

MANUFACTURING INDUSTRIES

From the above it is evidence that most of the manufacturing in the Province is concentrated in the Metropolitan district. The following tables reported by the Industrial Development Board of Manitoba for the year 1949, indicate the veracity of the above statements. It will be noted that as of December 31st, 1949, the City of Winnipeg and its surrounding municipalities account for approximately 82% of the employees reported and 83.5% of the weekly payrolls.

Table D indicates the employees reported in the years 1948 and 1949, in Manitoba. The 1950 December figure in both cases is slightly higher than that given for 1949.

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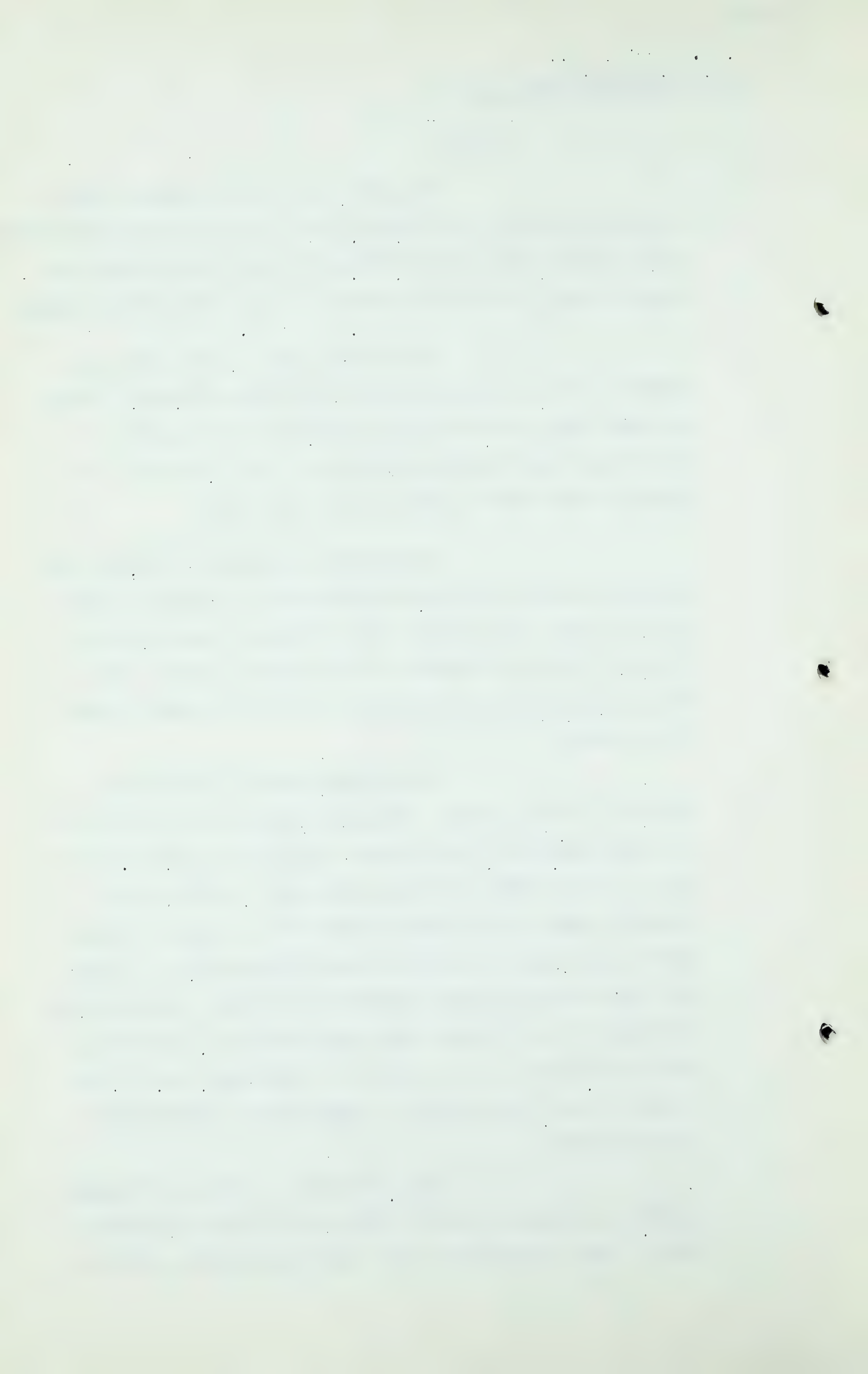
On Table E we have a similar tabulation for the City of Winnipeg, and you will note that of the total weekly payroll of \$1,815,000.00 for the Province as a whole in 1949, that \$1,483,000.00 of that came from Winnipeg.

Table F, on page 8, gives the employees of the eight principal industries, they are listed in that Table, with a total in Manitoba of 114,468, of which there are 72,501 in Winnipeg. Those have both increased about 4000 to 5000 in the past year.

Management and Labour relations are unusually stable, and the following two statements, which I will not read, show that. One of them is signed by the President and the Secretary of the Board of Trade, and the other is by two of the executives of the principal labour organizations.

It is significant of the future stability of the present community and industrial life of the Winnipeg district, that the Ford Company has just announced late in July, 1950, that they will erect a \$900,000.00 assembly plant in the Municipality of St. James. I might add to that that the General Motors Corporation of Canada are also moving in with a similar-sized plant, the location of which I do not believe has been definitely announced, but it is within the city limits of Winnipeg, that is all I can say, and they expect to spend about \$1,000,000.00 to start with.

The population of Greater Winnipeg in 1946 is shown in Table G. That was the last available data. That includes all the outlying suburbs, and is a



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total of 318,474,000.

Q MR.MARTLAND: 318,474.

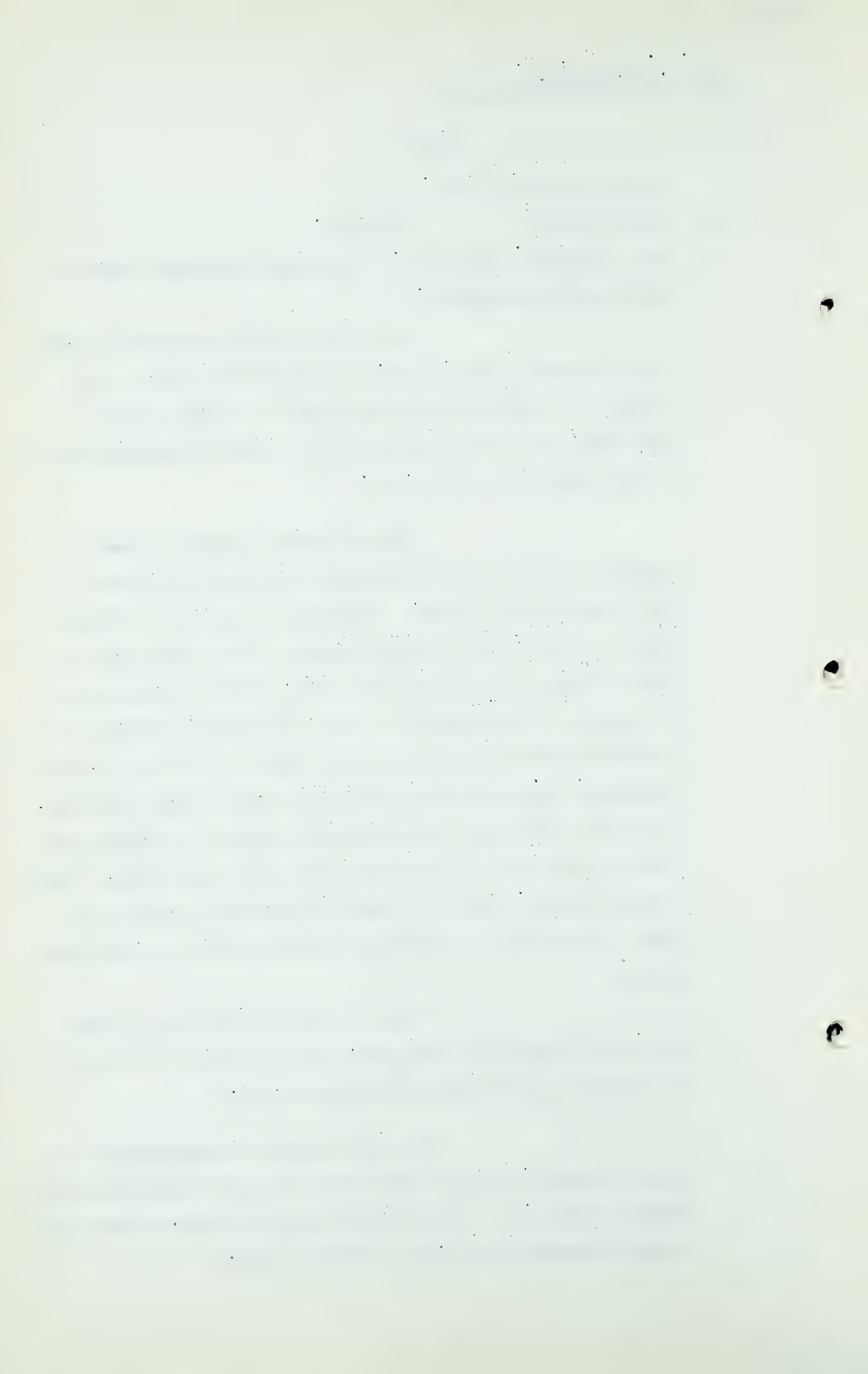
A Yes, 318,474. Excuse me. I am wandering around here in millions and billions.

The City of Winnipeg shows 234,561 as of December 31st, 1949, and Henderson's Directory, based on a tabulation of the number of houses in the district, gives the figure for the combined municipalities on the same date at 368,100.

These figures indicate a stable community with a normal population increase from year to year from its own ranks. Winnipeg is known as a "Good Place to Live", and the large number of new homes built in the district in the last five years, most of them owner-occupied, is confirmation of this. The Dominion Bureau of Statistics Housing Census of 1941 shows a total of 65,353 dwellings, 42.8% owner-occupied and 65.8% single dwellings. The three following Tables show the number of housing units built in the City of Winnipeg in the last five years, housing characteristics, and the number of building permits and their value issued in Winnipeg and the Suburbs in the same period.

There are now in Winnipeg a total of 56,289 single dwelling units, or dwellings of one type or another, and in Greater Winnipeg 75,231.

The total housing accommodation is shown on page 12, and I think all you need to know there is shown in Table H. I will give the 1950 figures, which are slightly higher than '49, a total of 38,260.



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The number of houses, and this is the number of houses that have been provided in each year, added to 1950, 1315, 414 apartment suites, with 78 units that were demolished, giving the total housing units of 57,592.

The building permits in 1950 for Winnipeg, a total value of \$19,000,000.00 odd, and in the suburbs \$14,470,000.00. The total permits valued at \$33,930,000.00. Nearly all of the suburban permits are for individual houses. A fair number have been built under the Wartime Housing Act but regardless of the individual or authority constructing these homes, or their location, they are practically all owner-occupied homes. It is extremely difficult to obtain a house for rent within the district, and almost impossible to so obtain a new one.

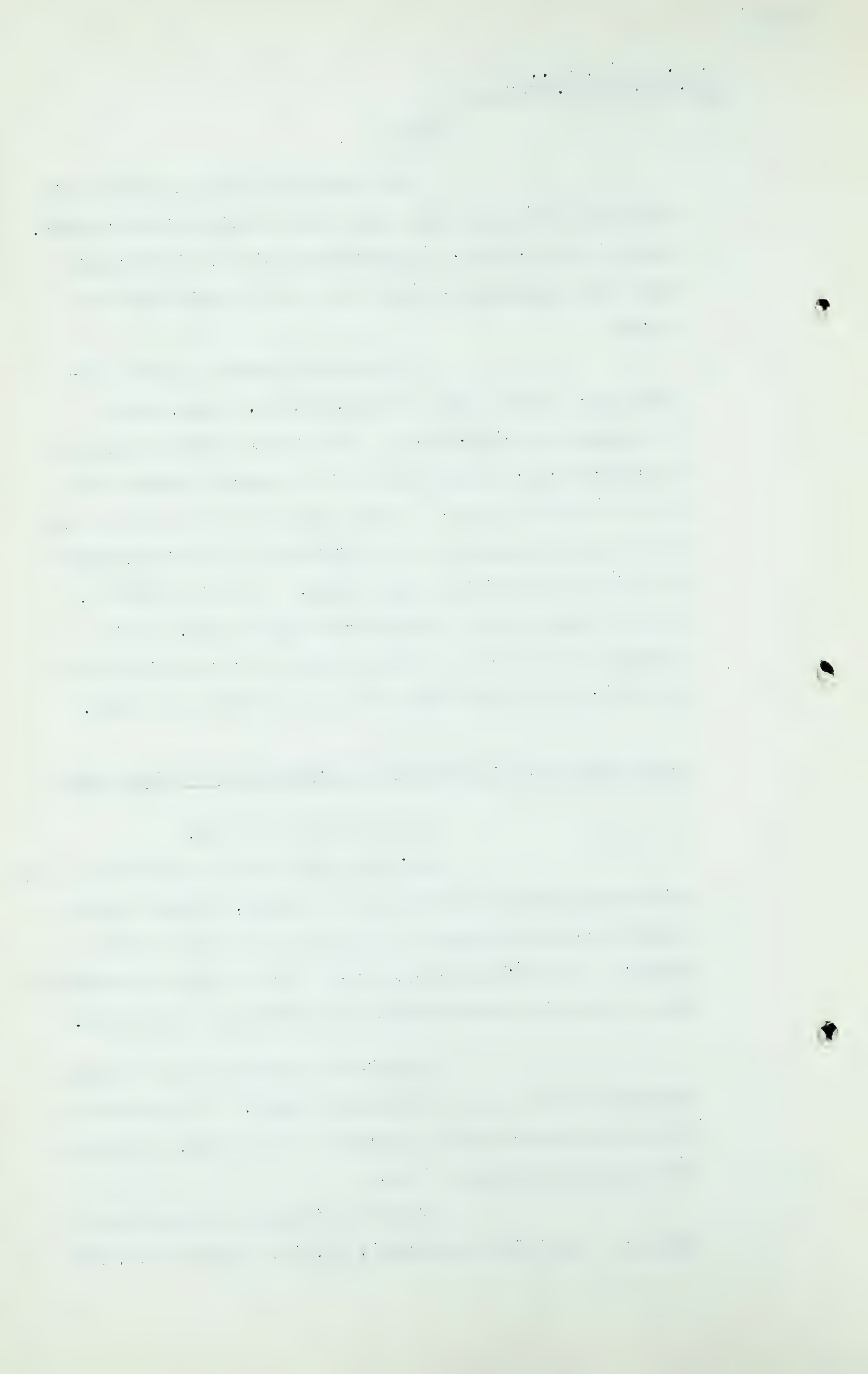
FUEL CONSUMPTION - PROVINCE OF MANITOBA FOR THE YEAR 1948

In some cases for 1949.

Fuel consumptions for the Province have held fairly steady for the past few years, being slightly higher than the average in 1949 due to a rather severe winter. 1950 will probably show a still higher consumption due to the very severe January and February of this year.

Total fuel consumption for heating purposes of all kinds is shown on Table J. This does not include an undeterminable quantity of wood fuel, which was quite popular during the '30s.

I have the figures on page 14 in Table J. The total coal was 1,701,317, which was 47.81%



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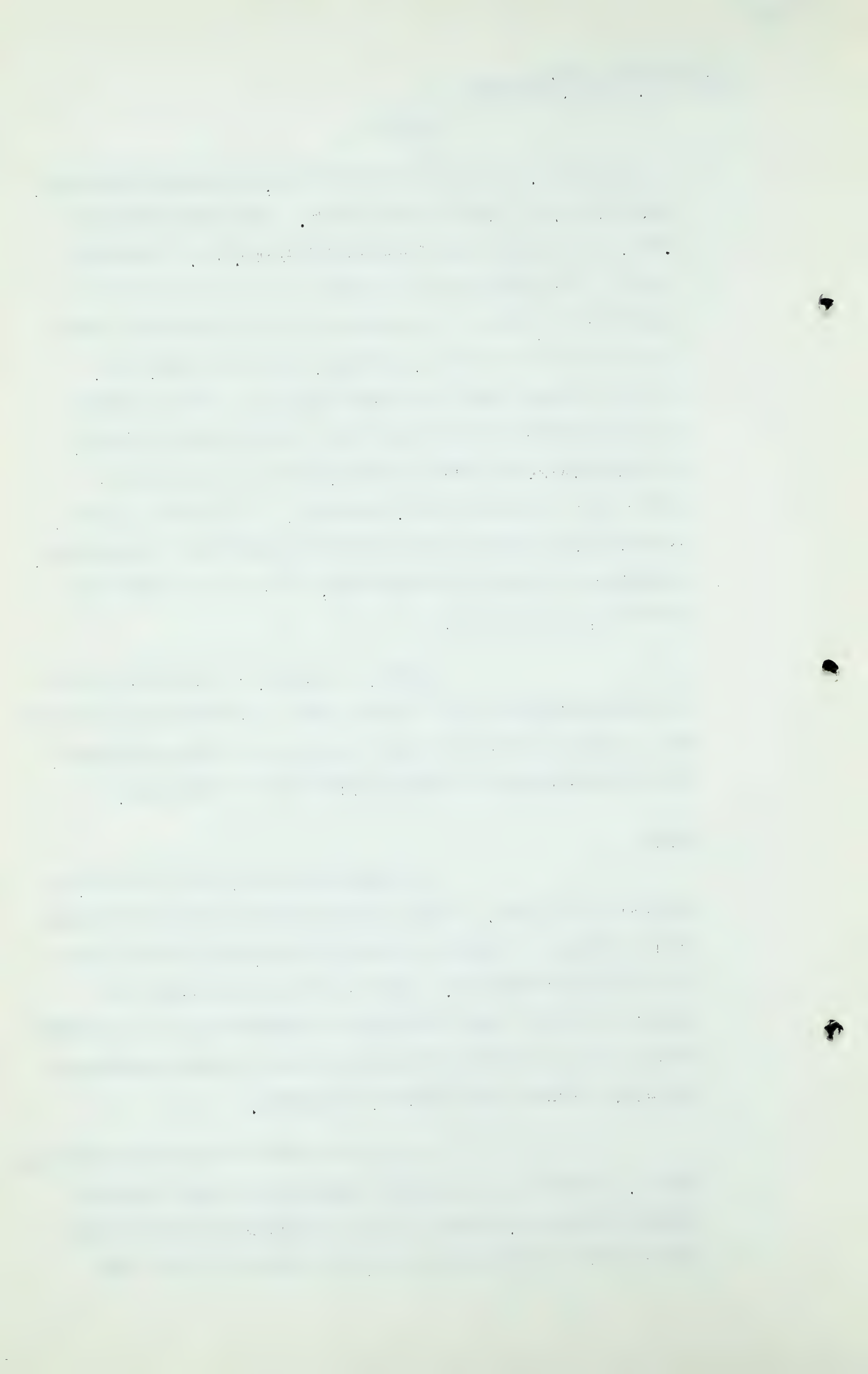
of the total. Fuel oil at that time, in Imperial gallons, 26,618,000, or 7.23% of the total. Gas accounted for .60%. And electricity accounted for 44.36%. I have included electricity in this because it does account for a considerable load. It accounts for a considerable load of one sort and another, cooking, water heating, etc. You will notice that the total millions of BTUs consumed in the Province in the year 1948, the millions of BTUs, is 65,205,332, and that is equivalent to thousands of cubic feet of natural gas, that is, at 1000 BTUs of gas, and 65,205,000,000 is the potential natural gas consumption, assuming we took over everything, which it is almost impossible, as you know.

Again, I repeat, it should be noted that approximately 20% of this power in the Winnipeg district is secondary power for steam raising and similar purposes, and is susceptible of being replaced by natural gas.

COAL

The principal fuel for actual heat production is coal. Table K shows sales reported by Retail Fuel Dealers of the three Prairie Provinces for the years 1947 to 1949 inclusive. Table L shows Industrial Consumption for the same territory and Table M sales by Retail Fuel Dealers in Greater Winnipeg for the heating seasons of 1947-48, 1948-49, and 1949-50, inclusive.

I will not bother to read the following Tables. Table K is the Retail Consumption Sales for the Prairie Provinces; Table L is the Industrial Consumption; Table M shows the sales of coal and coke by retail fuel



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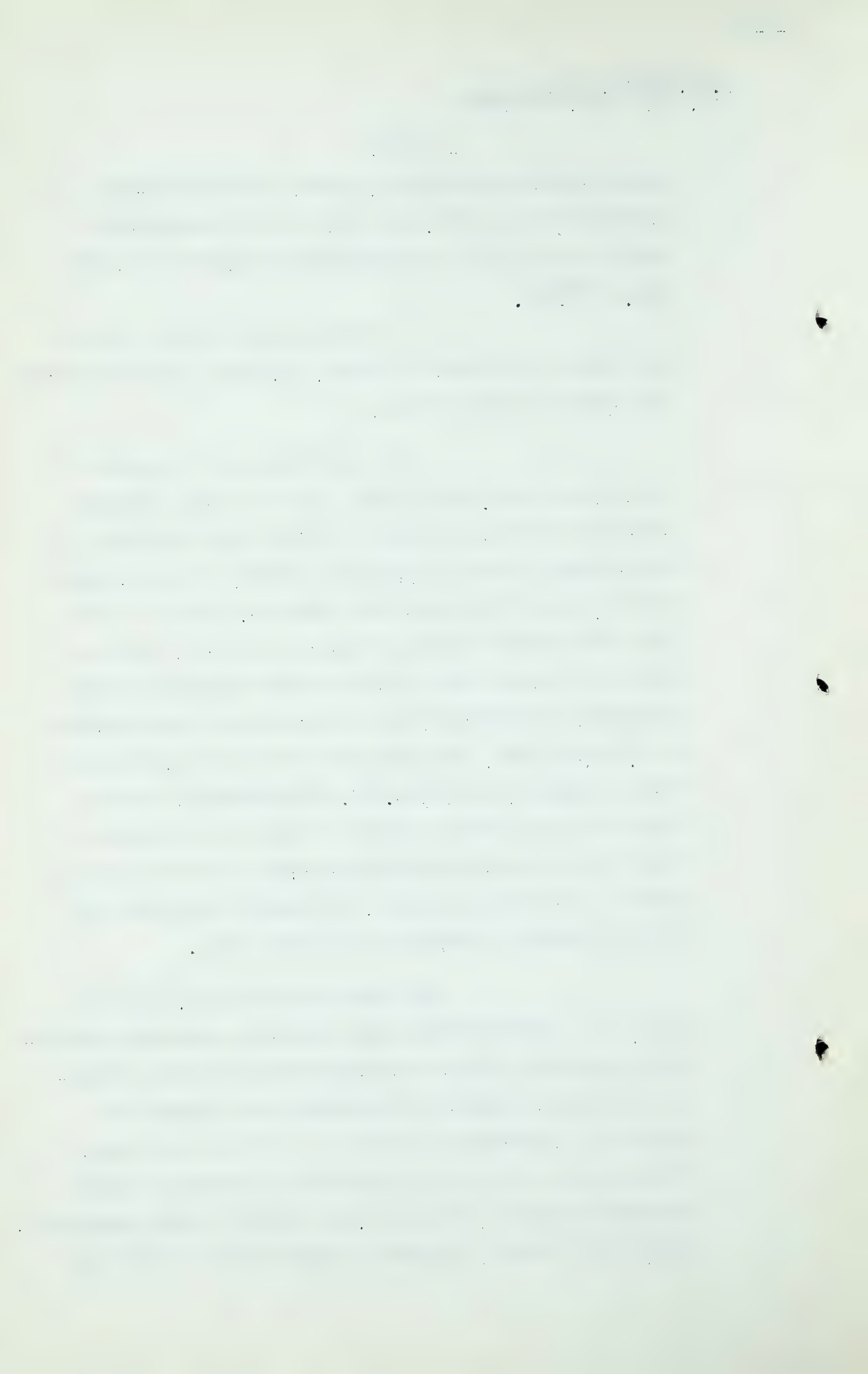
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dealers in Greater Winnipeg, which, for the 1949-50 heating season was 854,811 tons, and for the 1950-51 season that has gone up approximately 42,000 or 43,000 tons, 897,226.

It is interesting to note that on the total of the 1949-50 tonnage, 12.43% of that is imported coal from the United States.

Also significant is the source of the coal and coke. Practically all of the coke consumed within the Province is made at the Gas and Coke Plant of The Winnipeg Electric Company Gas Utility. Table N, pages 1 and 2, shows the production, transfer, and use of all coal mined within the three Prairie Provinces, and it is important to note that in the year 1949 Alberta's total production of Bituminous and Sub-Bituminous coal amounted to 8,614,596 tons. Manitoba received only 799,813 tons of this production, or only 9.28%. Consequently, the conversion of this entire tonnage in Manitoba to Natural Gas could not have a crippling effect upon the outlook of the Alberta coal mining industry. A complete conversion of this kind would be impossible for many years.

We come now to page 22, Petroleum Fuel, and I might add here that obtaining comparable statistics from year to year on petroleum fuel is rather difficult in that the Bureau of Statistics has changed its methods of classification about two or three years ago, I believe it is also in the process of changing it again. Comparable figures, therefore, are subject to some questions, and, quite frankly, if anyone attempts to pin me down to



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the authenticity and the relationship of these figures, here, with regard to the Table O on page 23, I just simply have to say that it was copied holus bolus from the Dominion Bureau of Statistics figures.

Table O, on page 23 shows in Manitoba in thousands of Imperial gallons, in the year 1948, 44,949. That would be 44 million gallons. The consumption in Canada for the same period was 1,755,162,000 gallons. The total in Manitoba from 1948 to 1949 has increased from 44,000,000 to 50,000,000 and a half, approximately, gallons.

Winnipeg and Brandon took, in the year 1948, back in the year 1948 they consumed 3,773,000 gallons. In 1949 that figure has approximately doubled, and is now 7,165,000. That is for Winnipeg and Brandon, and what intermediate territory I would not attempt to say.

CENTRAL HEAT

There are two classifications of Central Heat (heat supplied from without the premises) in the City of Winnipeg. One private company supplies, as of June 1st, 1950, 2,721 meters with steam or hot water. Most of these homes are in the better residential district and include a small number of apartment blocks. Their fuel consumption is included in the previous totals reported and covers both coal, oil, and electricity.

Most of these premises should be very susceptible to Natural Gas heating as the cost of Central Heat is highest in the City. Another possibility is the

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lowering of central heating costs from the use of Natural gas in the power Plant itself.

The second classification covers the City-owned steam heating system, operated in the down town district as part of the City Hydro Electric System which supplies steam heat to a great many downtown office buildings, stores, etc. Again their fuel consumption is included in the totals but the details are given in the following table.

Some individual buildings would be good prospects for Natural Gas, particularly those whose boilers have been kept in good condition and used as stand-bys every year or so. The main steam plant would be an excellent prospect for Natural Gas use.

Following that there are several Tables giving the kind of individual heating units within the Province and within the City. There is one Table which indicates, if anything, that practically all of the homes in the Winnipeg district are susceptible to conversion to natural gas heat.

WINNIPEG CLIMATE

The climate of Manitoba and Greater Winnipeg is probably as severe in the winter months as any community of comparable size on the North American continent. Winters are long and very cold, and, in contrast, summer weather in short periods is apt to be extremely hot. The following tabulations over a five-year average give a very clear picture of this situation.

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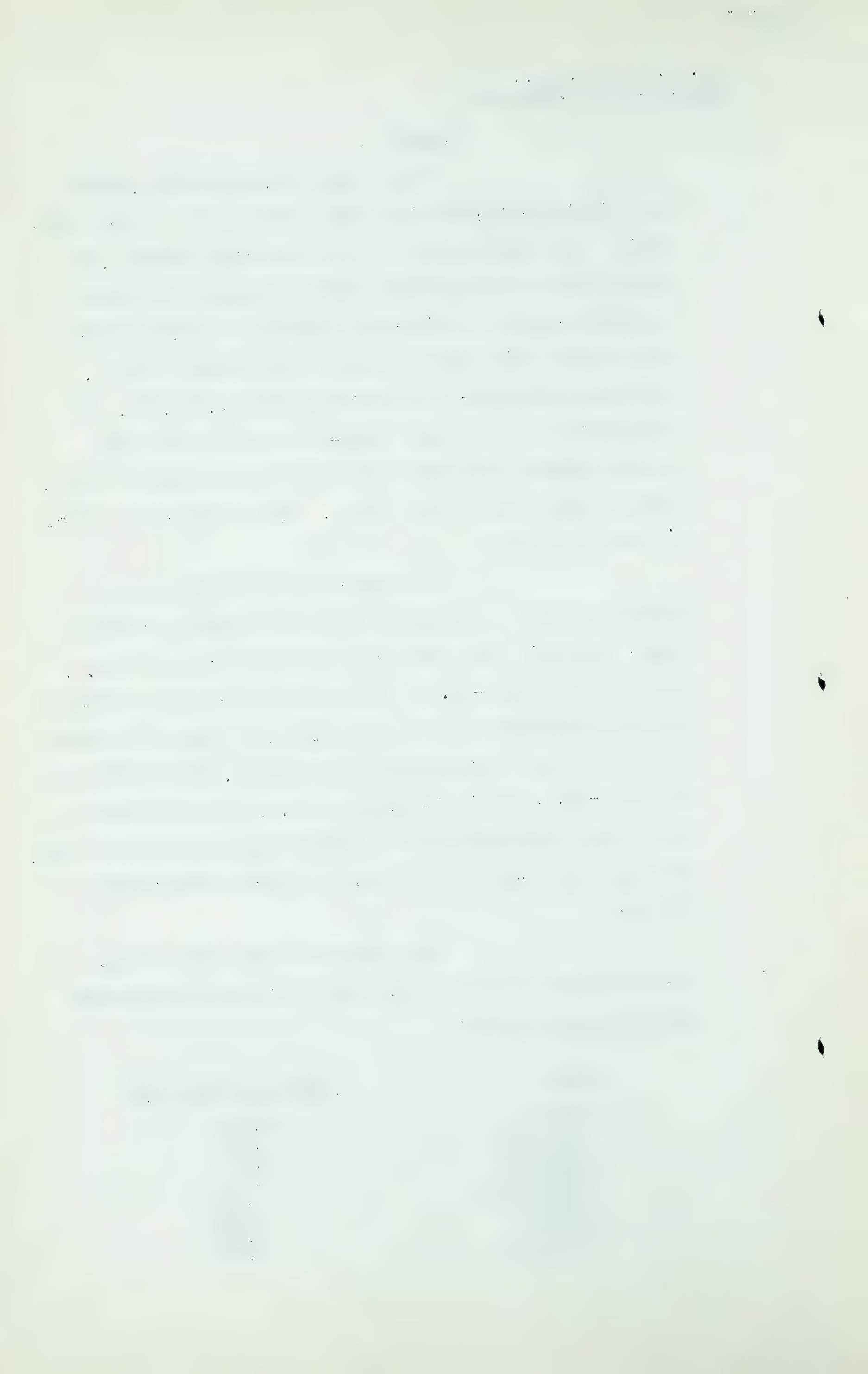
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Now, Table R, on page 26, gives some tabulations, and it is over a five-year average and gives a very clear picture of the Winnipeg climate, the degree days for the various months throughout the year are given, with the five-year average of 11,039 degree days for the five years ending in the Spring of 1950. The season of 1950-51 was slightly warmer, 10,879. In that period, for the year 1949-50 we had 86 days with the thermometer below zero, we had 32 days with the thermometer less than 20 below zero. Those figures for '50-'51 were 76 and 20.

The average mean temperature by months is given on Table S, with the extremes in each year. You will note that the extreme in '49 was -43.4, and in '50 it was -50.0. I believe last year was somewhere in the neighbourhood of 35 below zero. The days below zero for the various months immediately follow. The extreme in '49 was -43.4, and in '50 it was -50.0. I believe last year it was somewhere in the neighbourhood of 35 below zero. The days below zero for the various months immediately follow.

The five-year degree day average of 11,039 compares with the following cities in the Dominion and the United States:

<u>City</u>	<u>Average Degree Days</u>
Winnipeg	11,039
Vancouver	5,118
Calgary	9,650
Edmonton	10,285
Minneapolis	7,850
Duluth	9,480
Toronto	7,732
Montreal	8,417



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And the authority for those figures is the American Society of Heating and Ventilating Engineers, who keep pretty close track of these things.

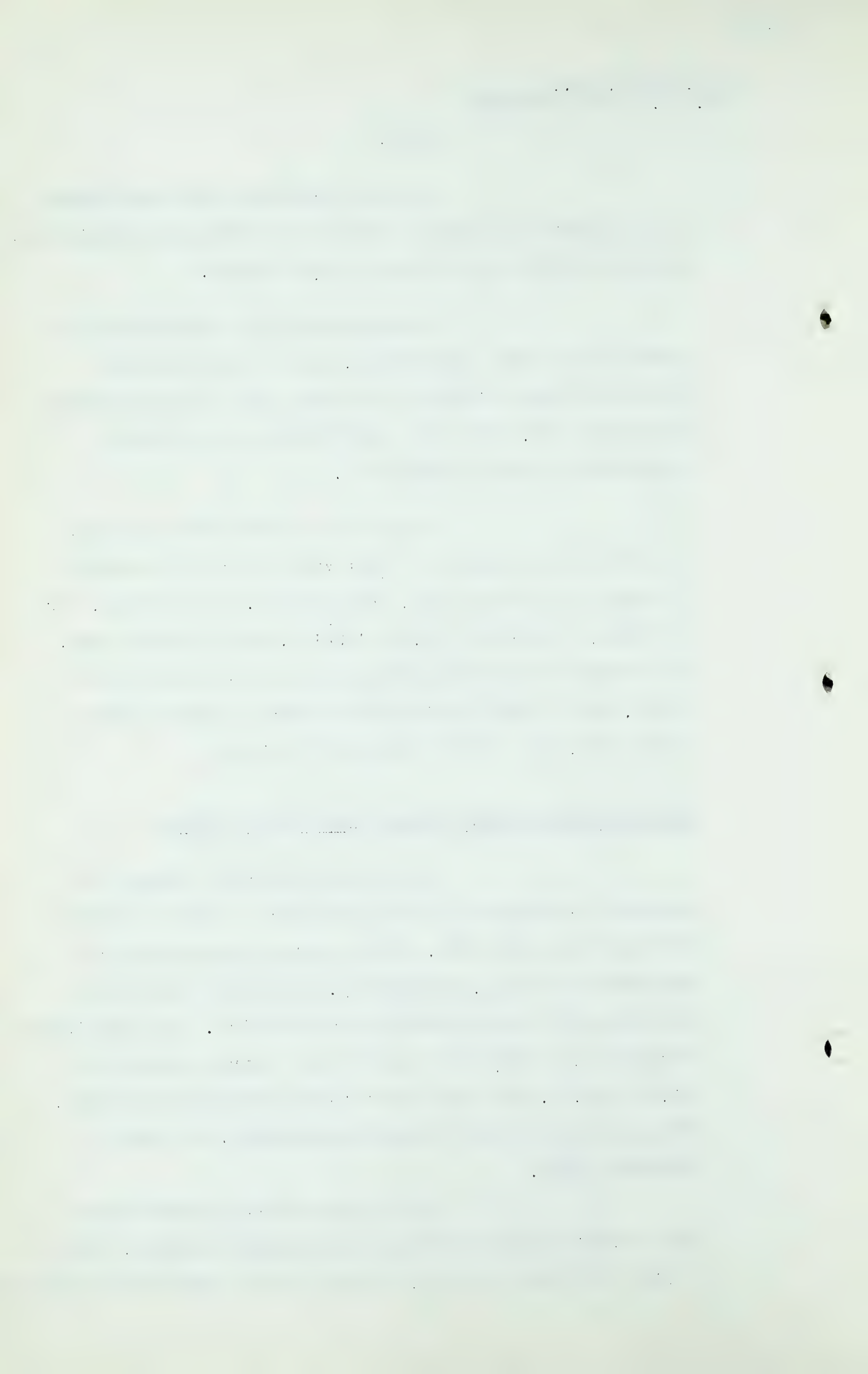
Long sustained low temperatures as shown by the above tabulations, that is for Winnipeg, develop an ideal situation for house and building heating by Natural Gas, and over a much longer period than is experienced in most communities.

I think if we turn back one page, you will get the impact of that with regard to the number of degree days below zero, and below 20. In November, for instance, we had one day, in '49-'50, one day below zero, in December we had 16 below zero and 2 were less than 20 below, and we carry on into March where we have 14 days below zero, and 3 days less than 20 below.

THE WINNIPEG ELECTRIC COMPANY AND ITS UTILITIES.

The Winnipeg Electric Company as presently constituted is the successor to various companies incorporated since 1873. These include manufacture and distribution of gas, electricity, and street car service throughout the entire Metropolitan district. Its organization includes 2,370 employees and it has a current payroll of \$5,876,114.00. That was when this was written in November. That payroll has gone up approximately 10%. That was in November, 1950.

Then follows short observations on the electric utility and the street railway company, which I will not bother to read, but they are in there for the record.



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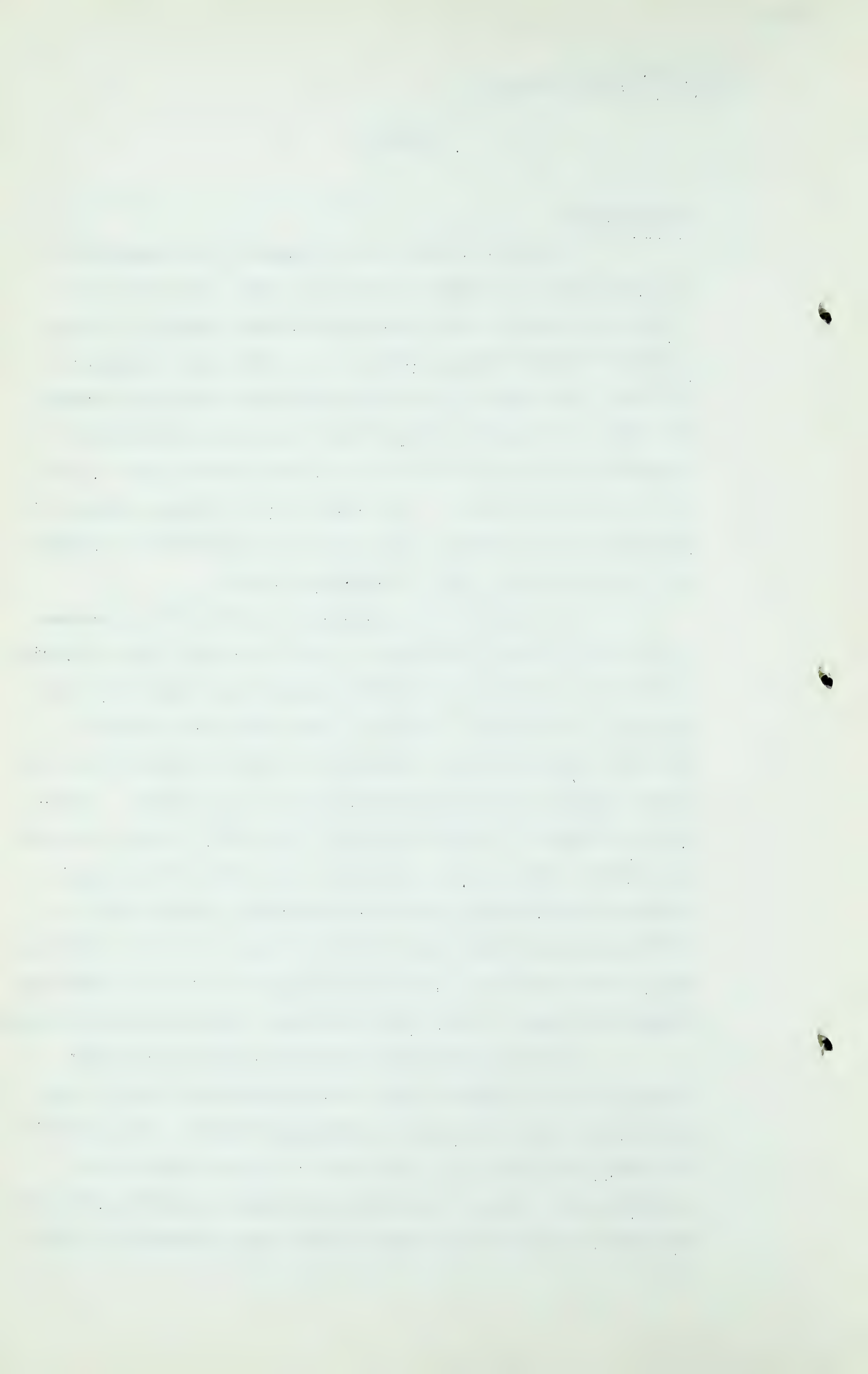
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Gas Utility

The Gas Utility was originally incorporated as the Winnipeg Gas Company on March 8, 1873, this being the oldest operation of the Winnipeg Electric Company. It was acquired by the Manitoba Electric and Gas Light Company in 1880 and the latter by the Winnipeg Street Railway Company in 1898. It operates a By-Product Coke Oven Plant with a capacity of 3 million cubic feet of gas per day and 52,000 tons of coke per year. Its Distribution System consists of 145.597 miles of mains, and serves approximately two-thirds of the area of the City of Winnipeg proper.

Its production facilities consist of a seventeen oven Koppers-Becker By-Product type Coke Plant with a capacity of 205 tons of coal per day with appropriate coal and coke handling facilities, by-product and purifying equipment. The coke ovens commenced operation in 1924, replacing an old Retort Plant that was originally built around 1902. Originally designed to handle American Gas Coal, it was converted to British Columbia Coal from the Crow's Nest Pass area in 1933 with additional coal mixing equipment being added in 1938 to properly blend two different kinds of coal. The oven walls were rebuilt in 1936 and 1937 and are in fair operating condition today. They are beginning to show signs of old age.

The coke handling system was put in operation along with the ovens in 1924. It separates the run of oven coke into stove, nut, and pea sizes and breeze. Most of the pea coke and some nut is consumed in the gas producer to underfire the ovens, the total amounting to around 6,500 tons per year, thus leaving around 45,000 tons available for sale



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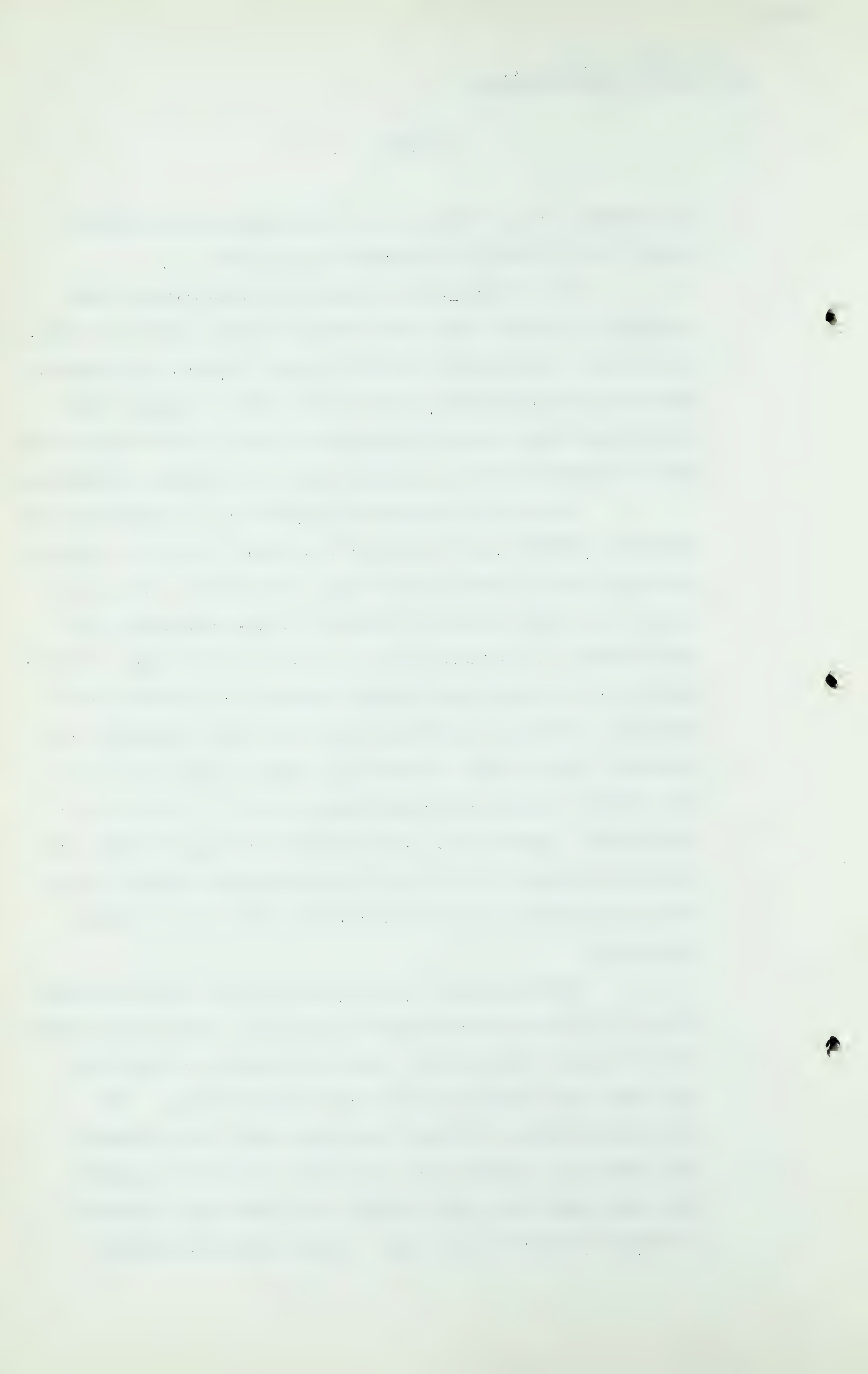
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as domestic coke. This is in strong demand in the local market and is readily disposed of each year.

The by-product equipment is quite old and was converted to handle the coke oven gas at the time the ovens were built. Along with the coke ovens, signs of old age are appearing throughout the Plant and it is anticipated that when Natural Gas reaches Winnipeg the present Coke Oven Plant will be abandoned and no attempt made to distribute mixed gas.

A ten foot diameter Water Gas Set was installed in 1929 as a standby for the Coke Oven Plant. It has a capacity of four million cubic feet per day. Except for the period in 1937 and 1938 when the ovens were being repaired, and a small amount of peak shaving in the early 1940's and a five week's period during the Western Canadian Coal Strike early in 1948, this Water Gas Plant has seen little operation, its generator having been relined only once and that after the Coal Strike session just mentioned above. It is readily convertible, however, to the production of high Btu Oil Gas, reformed Propane, or other similar production methods to act as peak shaving for Natural Gas should this later become necessary.

December 22, 1945, the first 30,000 gallon Propane Storage Tank was installed with appropriate vaporizing equipment to produce Propane Air when the capacity of the Coke Oven Plant was exceeded during the winter months. Two additional Propane Storage Tanks were added in September, 1947 along with additional vaporizing and mixing equipment and today there are three propane air jets with a capacity of 500,000 cubic feet per day. Two additional propane-



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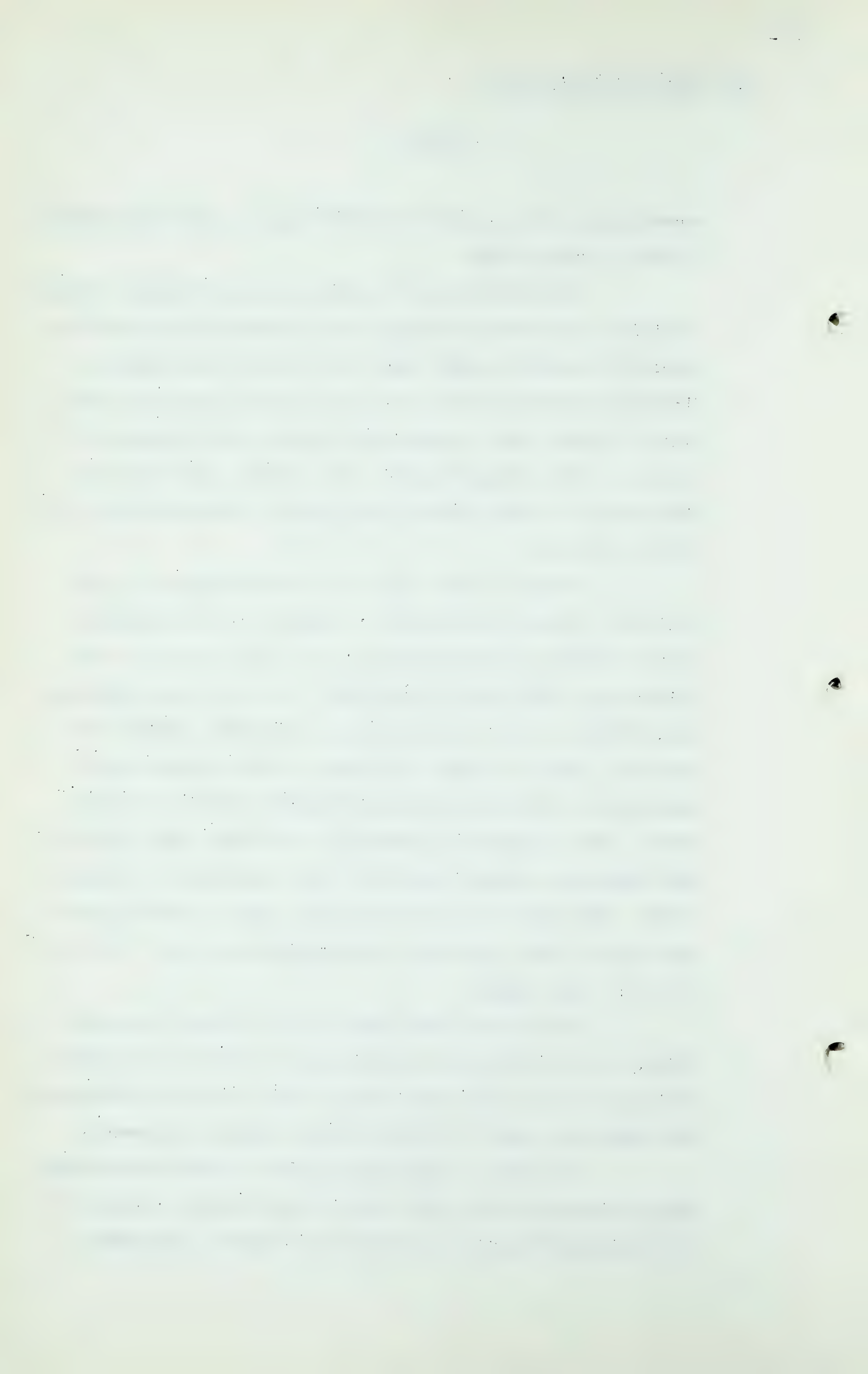
producer gas jets assist in underfiring the coke oven battery to save producer coke.

With additional storage and vaporizing and mixing facilities this Propane Plant can be expanded to provide an adequate standby or peak shaver for Natural Gas service. 1350/1400 Btu Propane Air has proved to be a satisfactory, I should probably say a mixer with natural gas in several locations in the United States. The ultimate size of this Plant would be determined by the amount of Natural Gas sold in the district.

Tables T and U show the classification of gas sales for the past five years. Roughly, we run approximately slightly under 8 million cubic feet per year, the figures for 1950 being 791,398,000. The total per customer 16,450 with a verage consumption per customer, 47,300 feet per day. Table U on page 33 shows the net revenue which amounts to a little better than 760,000 dollars a year in 1950. The residential proportion is 35.9%; house heating, 6%; commercial, 28.4; industrial 28.2 and sales to company, 1.5%. The table on page 34 includes Table V and on page 35 are our gas rates which are self-explanatory, and I will not bother to read them.

It will be noted that the Gas Utility sales of 779,862 MCF in 1949 with a peak day of slightly over three million feet, is quite small for a City the size of Winnipeg. The reason for this is quite evident from the following.

In 1906 an influential group of Winnipeg citizens being irritated by the then high electric rates charged by the Winnipeg Electric Street Railway Company, persuaded



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taxpayers to provide a Hydro Electric System of their own. The Pointe du Bois Plant on the Winnipeg River first delivered power to the City in 1912 and the Slave Falls Plant followed in 1931. It will be seen from Table C that the City Hydro now distributes more total power in Greater Winnipeg than the Winnipeg Electric Company. In the early 1920's the City Hydro started an active campaign to replace gas cooking by electricity, the cooking load then being the principal source of revenue for the Gas Utility. Free wiring in apartment blocks and a net rate of nine mills per kilowatt hour for cooking purposes - those gentlemen from the United States please note that nine mills per kilowatt hour for cooking.- plus a passive attitude of the Gas Utility in the matter, had the inevitable result, so that literally thousands of homes and apartment suites threw out their gas ranges and installed electric. The then net gas rate of \$1.20 per Mcf was over 40% more expensive than the nine mill electric rate. The present net \$1.25 cooking rate is 47% more expensive.

The City Hydro operates only within the City Limits but as residential areas spread out through the City outskirts and into the suburbs beyond the reach of the gas mains, electric cooking had become so popular that the Winnipeg Electric Company itself advocated its installation in all new homes beyond the gas mains, having to run its power lines out there anyway and thus saving the cost of a duplication of service.

Starting in 1938, an active campaign by the Gas Utility slowly reversed this cooking trend (within the geographic limits of the Distributing System) and at the

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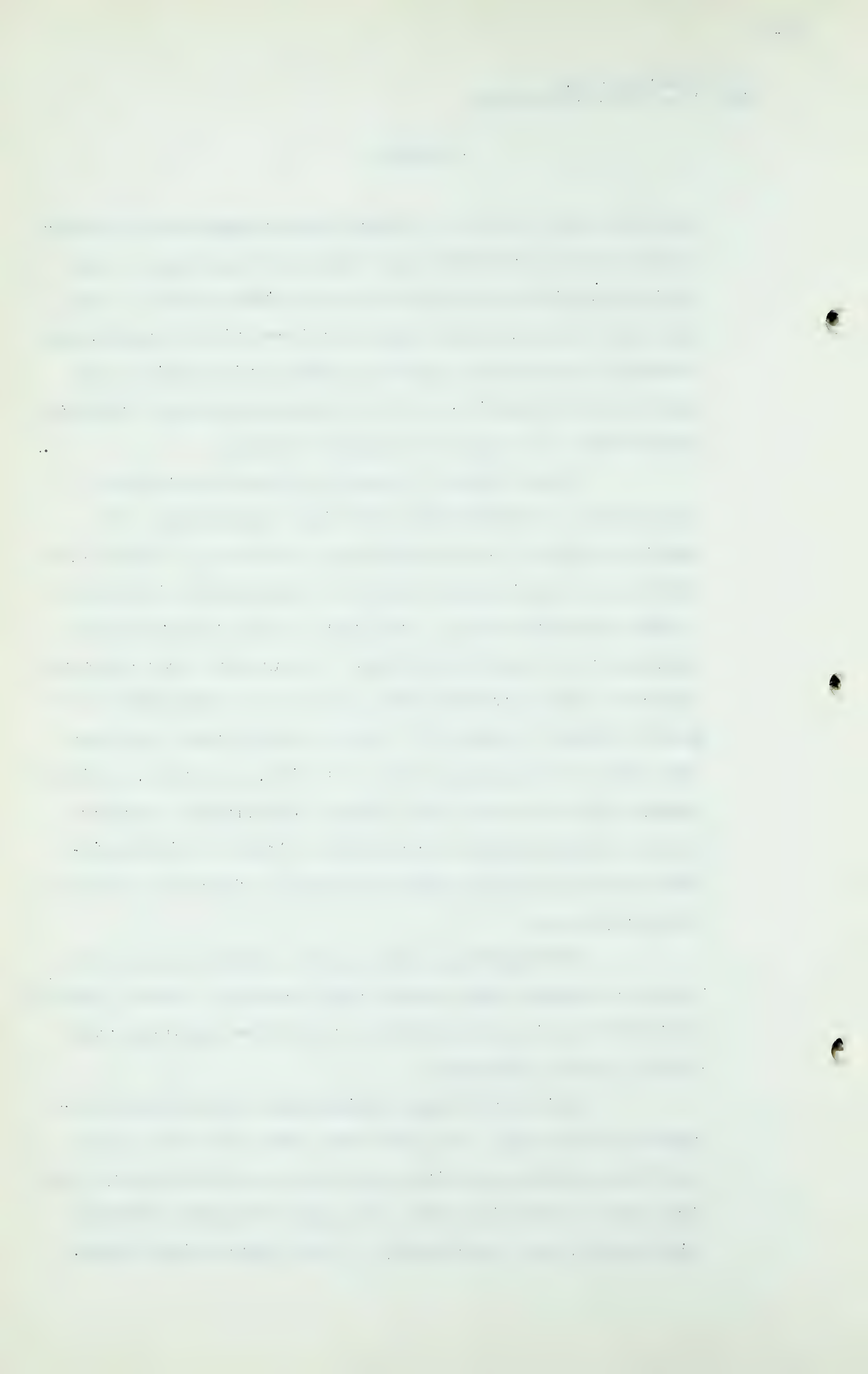
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same time made a drive on high revenue commercial and industrial business. Present gas loads are very close to production capacity and distribution capacity as well. More gas could be sold, particularly for industrial purposes, but increased production facilities would require additional distribution facilities and the return from these increased sales would not warrant the capital layout.

Water heating likewise suffers from electric competition. Both Electric Utilities supply power for immersion type hot water heaters at a flat rate of \$2.00 per month for a 3/4 kilowatt heater with appropriate increases to \$6.00 per month for a 3 kilowatt heater, the customers supplying the tank in all cases. An automatic gas hot water heater at 70¢ net per Mcf will cost in the neighborhood of \$4.00 or \$5.00 a month for a 20 U.S. Gallon tank, smallest size made in the popular model. It will, of course, deliver several times more hot water than a 3/4 kilowatt electric heater but many people are content to "get by" with an inadequate supply of hot water in order to effect the saving in monthly cost.

Refrigeration also is more expensive to operate in the gas models than the low rate electrics and all together the "all electric kitchen" has a great low operating cost appeal in this community.

Additional house heating has been completely restricted since 1941. The low sales price for this use of gas then existing, plus its extremely poor load factor, the high cost of producing this extra gas during the extreme cold weather, and the capacity of the Distribution System,



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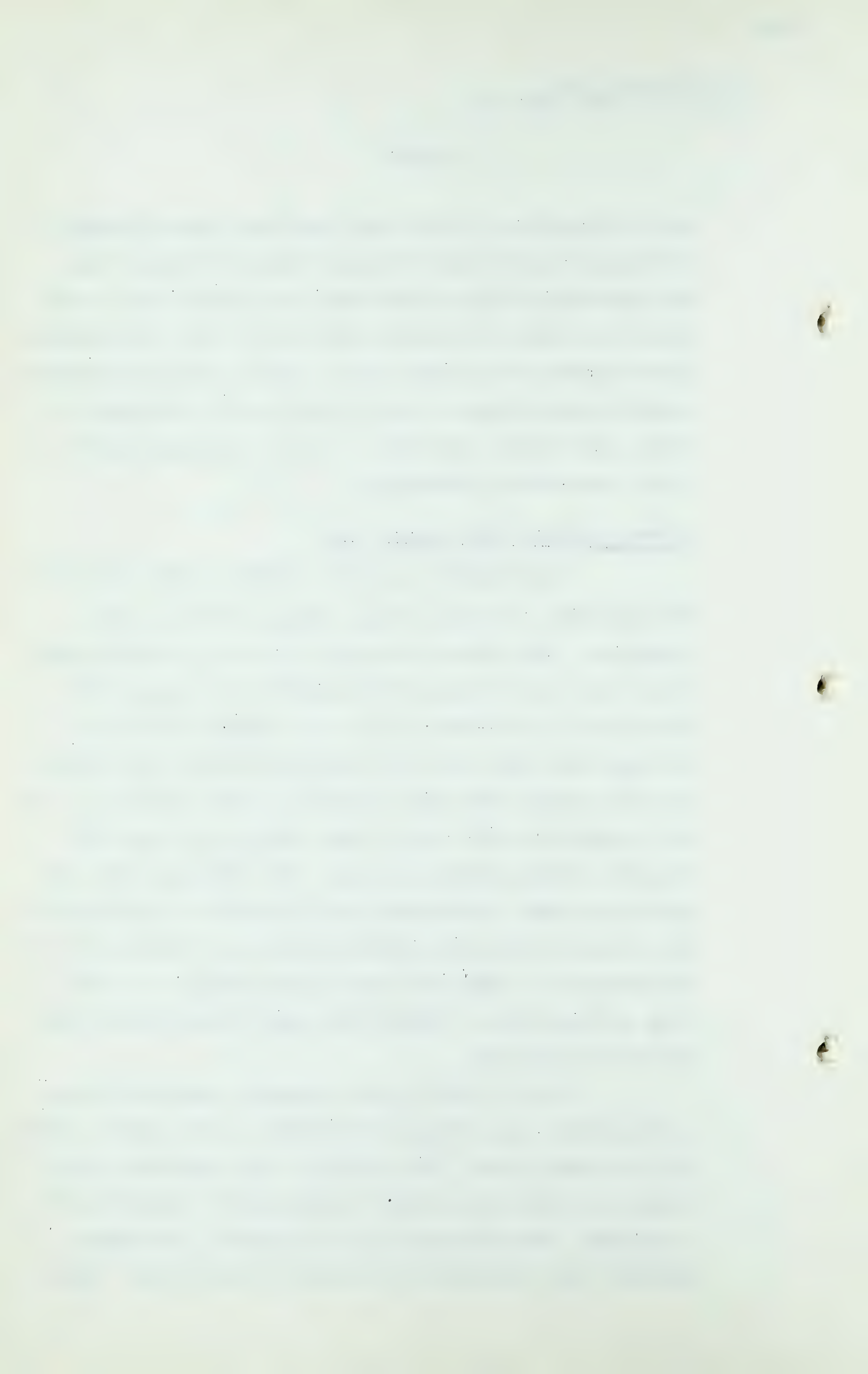
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made it expedient to refuse any additional house heating customers from this date forward. While new higher rates were granted in 1947 and 1948 for this service - it is now 70¢ per Mcf after the first 10,000 feet - only two customers have dropped off the lines since. Several hundred voluntary applications are now on file for this service whenever it might again become available. We have approximately 160 total space-heating customers.

FUTURE PROSPECTS WITH NATURAL GAS

The prospective arrival of Natural Gas in Greater Winnipeg will completely change the gas picture in this Community. While Natural Gas rates have not yet been determined and cannot be until the lay-down cost of gas at the City gates is developed, it is a safe assumption that the average sales price per Mcf of Natural Gas will be no higher than the present rates for slightly over 500 Btu gas, and in all probability will carry a lower average price per Mcf than the present manufactured gas. This will mean that the average customer can purchase gas to provide the same service now being received with manufactured gas at somewhere in the neighbourhood of 50% lower than present costs, due to the high heating value of Natural Gas, approximately twice that of manufactured gas.

Gas is comparatively expensive compared to competing fuels, particularly electricity, in the domestic field at the present time. Those using it are conscious of this expense and make every effort to keep their consumption at a minimum. Present house heating customers, for example, probably have their homes insulated to a much higher degree



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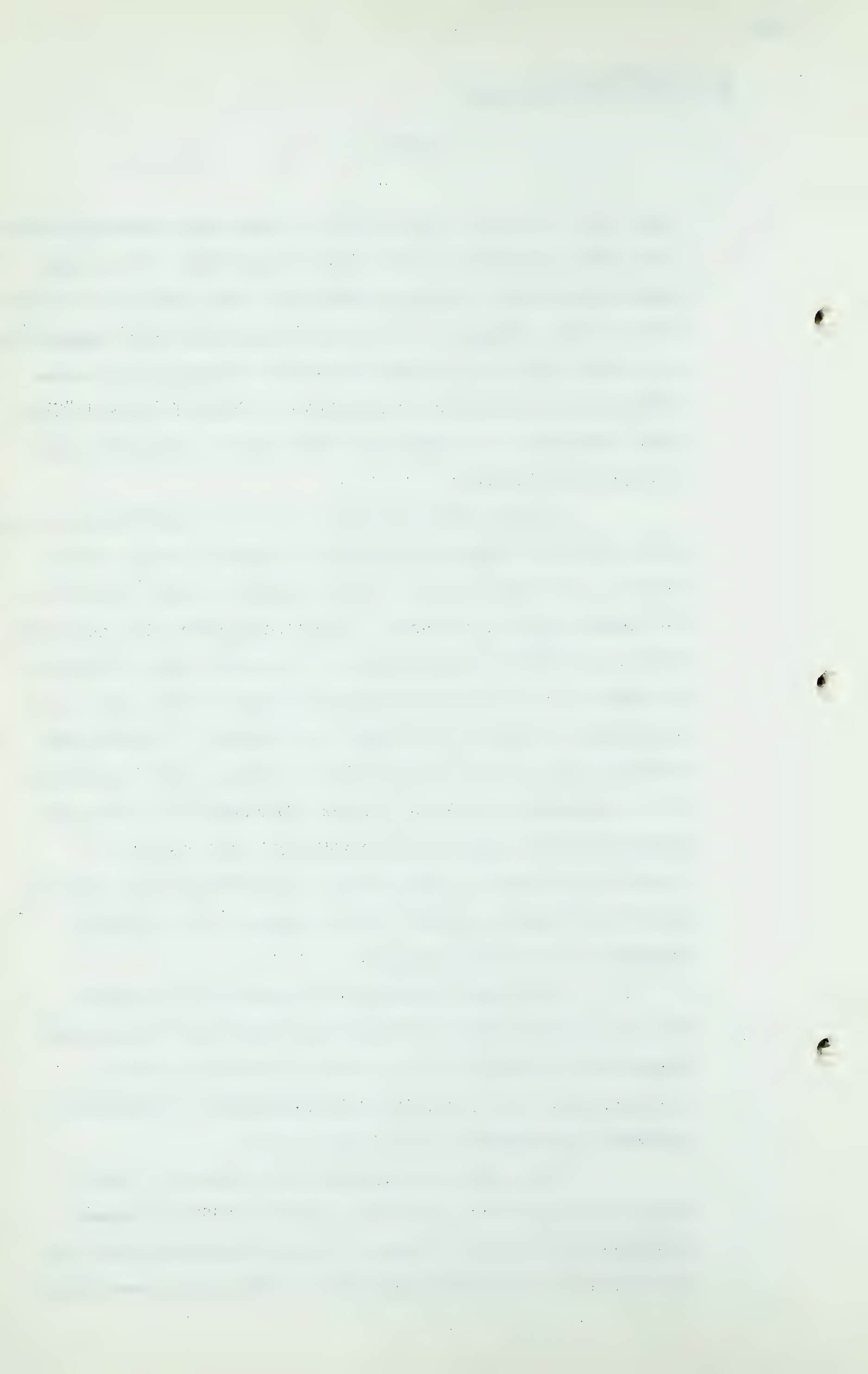
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than the average in this vicinity. Many water heating customers use a minimum amount of hot water to "get by". It is also known that present cooking consumption per customer is below the national average. It is felt, therefore, that comparisons on a cubic foot basis between present consumption of manufactured gas and future consumption of Natural Gas will mean very little and no attempt has been made to correlate the two sets of figures.

It is realized that the present Distribution System will have to be greatly expanded to properly service this district with Natural Gas. This present system is laid out to receive gas at one point, namely the present Gas and Coke Plant, and with the assistance of one small district holder, is adequate to maintain necessary pressures for present consumptions throughout its length and breadth. A great many new customers can be added to this system, particularly when it is realized that there are now approximately 7,000 dead services still connected to the mains. That figure is closer to 10 than 7, incidentally. New winter house heating peaks will impose a demand far in excess of its present capacity as fed from one point.

The large majority of new domestic customers will be obtained beyond the physical limits of the present Distribution System and it is felt, therefore, that an entirely new installation will be necessary, of which the present main network will be only a part.

This will be accomplished by running a loop or ring line completely around the outskirts of the present Metropolitan district. This will be of sufficient size to operate in the neighbourhood of 50 to 100 pounds pressure,

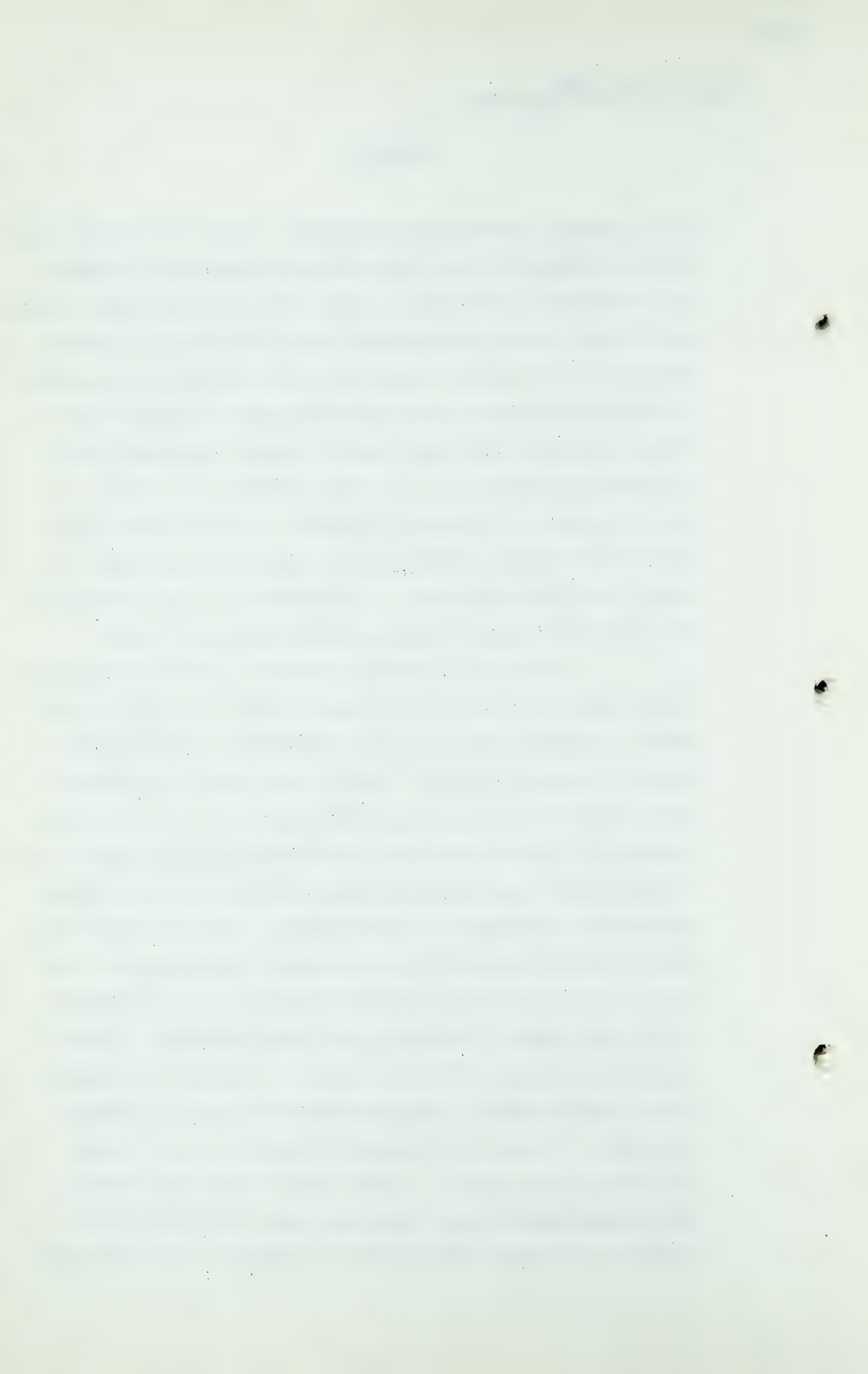


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will receive gas from the transmission line at the City gate, will distribute it to a new system throughout the suburbs and outskirts of the City proper, and at the same time deliver gas to the present low pressure system at strategic points through proper pressure regulators to reinforce the capacity of this old system to handle the expected increased load. This loop system will also enable various large industrial customers to receive gas at a much higher pressure than is now available, even were it possible to connect them up to the present system. This will be a material advantage in many industrial operations. Our Company is prepared to make the necessary expenditures to accomplish this result.

With this in mind an extensive survey of probable future sales was made by the Stone & Webster Service Corporation in collaboration with the Gas Sales and Engineering staff of the Gas Utility. Population, housing facilities, and present fuel consumptions of prospective industrial and commercial customers were examined in some detail and with the background of experience of Stone & Webster in many similar operations throughout the United States, the following tabulation on the prospective customers and consumption for the first five year period after Natural Gas is made available at the City gates of Winnipeg, has been developed. These figures are shown in Tables W and X. I believe the significant figures there to bring out are the effective annual customers. We have approximately 16,000, a little better than that at the moment. At the end of the first year we show 19,482 and in each succeeding year, 27,505; 34,327; 39,658 and 43,898. The peak day customers at the end of the

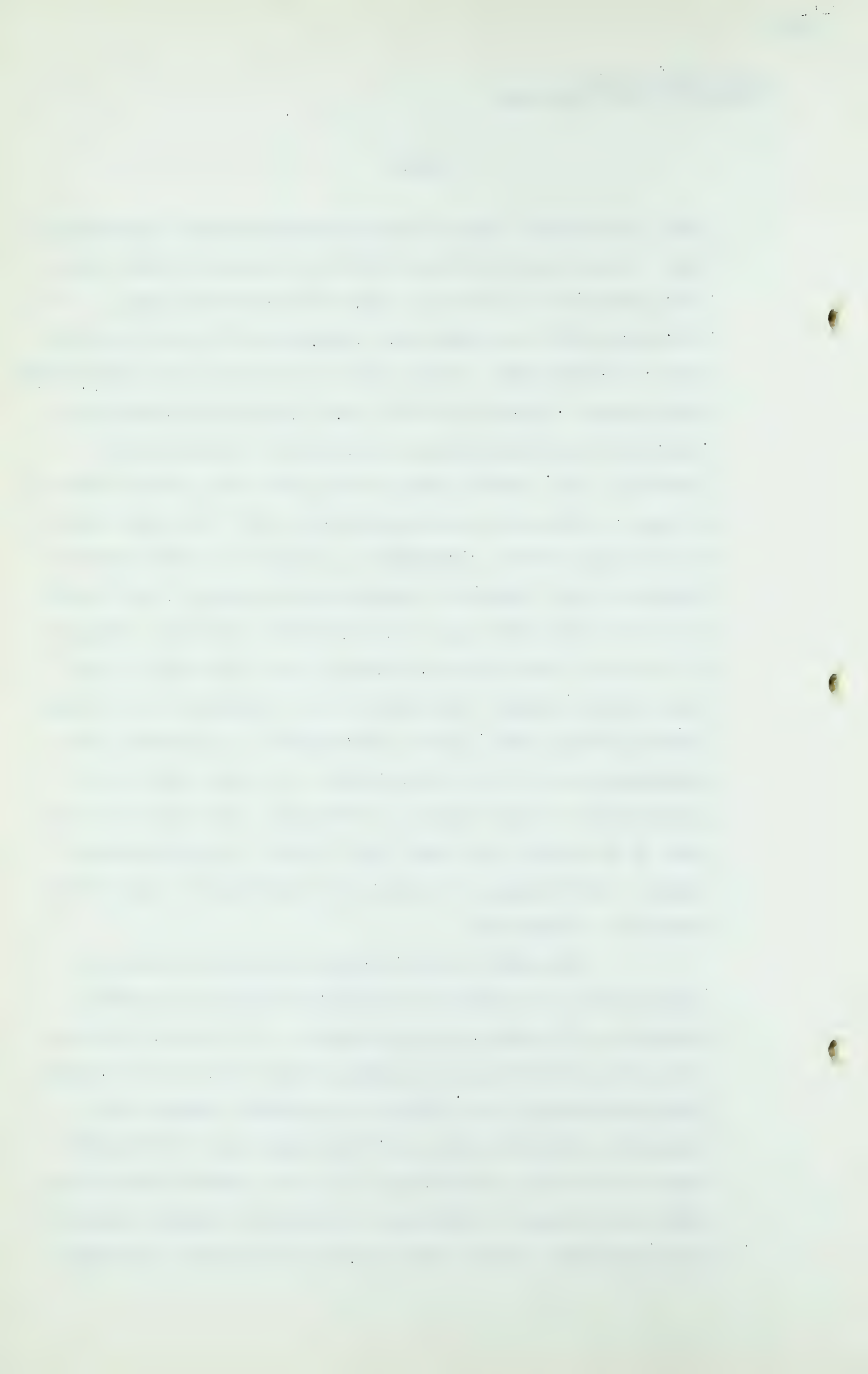


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year are somewhat higher as we go along with our construction work. Annual sales Mcf on a 1000 Btu basis, the first year, 1,522,000,000; second year, 5,247,800,000; third year, 6,787,000,000; the fourth year, 8,148,000,000, and the fifth year, 9,277,000,000. Peak days in the first year, 18,740,000; second year, 36,050,000; third year, 47,540,000; fourth year, 57,210,000, and fifth year, 65,800,000. The methods of arriving at the totals shown in the above are given in Table X on page 41, which are self-explanatory and I will not take up the time with them. Incidentally, those of you who are not acquainted with Calgary's consumption, we show a peak day at the end of the fifth year of 65,000,000 cubic feet. Calgary is currently distributing 65,000,000, or they were on last Thursday and Friday. They have still a long way to go before reaching their peak, which I understand is somewhere in the neighbourhood of 125 to 140 million. I do not want to be pinned down to those figures. They were just told to me and part of it stuck in my head, but I think I am approximately right. And Winnipeg, of course, is considerably larger than Calgary. On page 42.

In making up these figures it was necessary to consider the local factors that would influence consumer acceptance of domestic gas appliances. It has been pointed out earlier that electric cooking is well entrenched in this territory and while gas ranges are somewhat cheaper than comparable electric ones, and their operation with Natural Gas certainly more economical, it is not expected that there will be a wholesale abandonment of present electric ranges in good condition. It is felt, however, that over a five-year



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period the majority of new homes will install gas for cooking and there will be a strong tendency to replace worn-out electric ranges with gas ranges. Consequently at the end of five years it is estimated that the present approximate 13,000 cooking installations will increase to 20,000.

Automatic gas water heating, however, should have a large appeal in this territory and with the planned extensive sales promotion of this and other gas appliances, it is estimated that there will be 25,000 water heater installations at the end of the five year period and will be operating on $62\frac{1}{2}\%$ of the total services installed at that time.

By far the greatest build-up of the residential load will be space-heating saturation. Comfort, convenience, and low operating cost compared to the present solid fuels will enable these installations to be taken on about as fast as they can be connected up to the system. There are in the neighbourhood of 7,000 dead services - and again, I repeat, that is closer to 10, on later advice - on the present Distribution System, the large majority of which are in good condition and connected to premises that have discontinued the use of gas in favor of electricity. Most of these can be put back into operation by merely installing a pressure regulator and meter. No new house heating customers have been taken on for manufactured gas since 1941 but in spite of its comparatively present high cost, several hundred voluntary applications are now on file whenever this service might be available, testifying to its popularity, almost regardless of price. I mentioned that previously. Low cost Natural Gas in this territory where long cold winters make

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the household fuel cost a major item in the budget, will have an extremely strong appeal. It is estimated approximately 15,000 house heating customers can be connected to the lines at the end of five years, equalling 40% of the total services which should be in operation at that time.

No consumption has been estimated for gas refrigeration, though undoubtedly there will be quite a number of these appliances sold. Their consumption is comparatively small and their effect upon the total sales would in any event be a minor one.

Commercial and small industrial sales have been based upon current experience plus the fact that many space heating installations will be included in this category. Again it is necessary to rely on the experience of Stone and Webster in other Cities that have changed over to Natural Gas, but it is felt that the volume sales indicated are well in proportion to results already obtained elsewhere and well in line as compared to residential sales in other localities.

Large industrial sales have been individually developed from eight installations now using high grade coal or high priced light petroleum oils. By far the largest of these is a cement plant now using 70,000 tons per year of 13,000 Btu coal, or a Natural Gas equivalent of 1 billion, 820 million cubic feet per year. It is anticipated this particular unit will not be in full operation until after the first year and the others have been included in what seems to be a reasonable length of time to accommodate the change over from present fuel to Natural Gas. It is quite possible some of these may be brought in line earlier than presently expected.

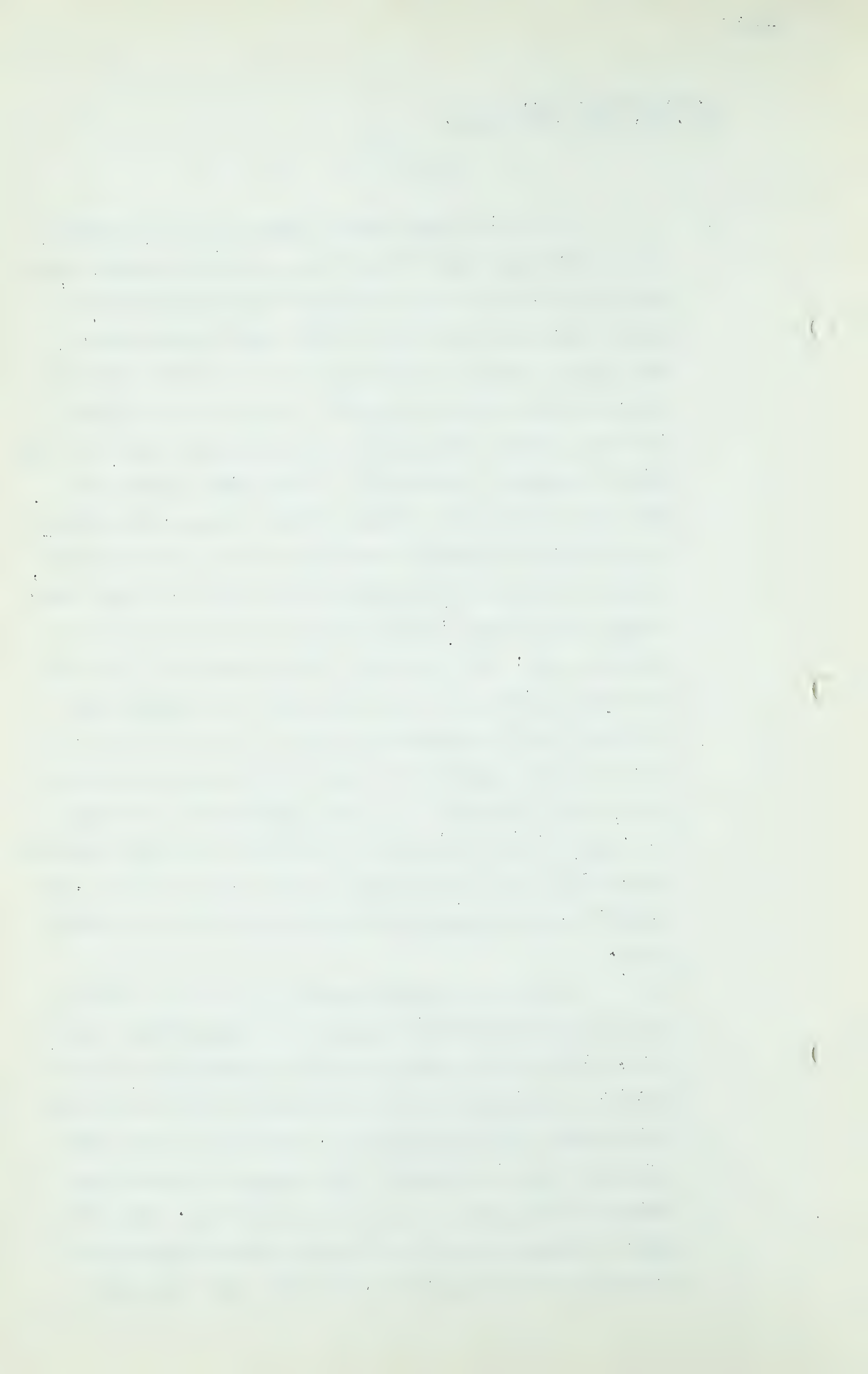


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A . As pointed out earlier there are few locations on the Continent where Natural Gas can have a greater customer appeal than in the Winnipeg Metropolitan District, particularly for house and building heating purposes. While space heating load factors are at the best none too good, Winnipeg winters are quite long as well as quite cold and present installations on manufactured gas use some space heating gas through all of the summer months. In addition, Winnipeg is growing, slowly perhaps, but surely, and an active Industrial Development Board for the Metropolitan District is anticipating the addition of many new, though perhaps small, industries to this location in the years to come. It is not felt by any means that the five year period covered in these calculations represent the ultimate growth of Natural Gas sales in this vicinity. It did not appear expedient to show these calculations beyond a five year period but it is anticipated that at the end of 8 years total firm sales will develop from the 9 billion shown at the end of the fifth year to over 12 billion, and a peak day load somewhere between 80 and 85 million cubic feet.

While the present operation of the Gas Utility of the Winnipeg Electric Company is a comparatively small one, it has on its lines a variety of commercial and industrial operations that is equivalent to any gas utility on the North American Continent. These run all the way from heat treating furnaces large enough to anneal ship anchors to the quick drying of printers' ink. Many of these operations have been developed almost from scratch by our Gas Sales Department, and while this department



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will of necessity be subjected to considerable expansion, the necessary talent is available to develop practically any kind of an operation where Natural Gas can be used.

It will be noticed that the 5th year industrial results in Table W coincide very closely with the 5th year figures already presented to your Board by Stone & Webster. The slight discrepancies are due to some figures having been developed at different times. It is the considered opinion of The Winnipeg Electric Company that these prospective results are well within its ability to produce once Natural Gas has been delivered to the City gates of Greater Winnipeg.

S U P P L E M E N T

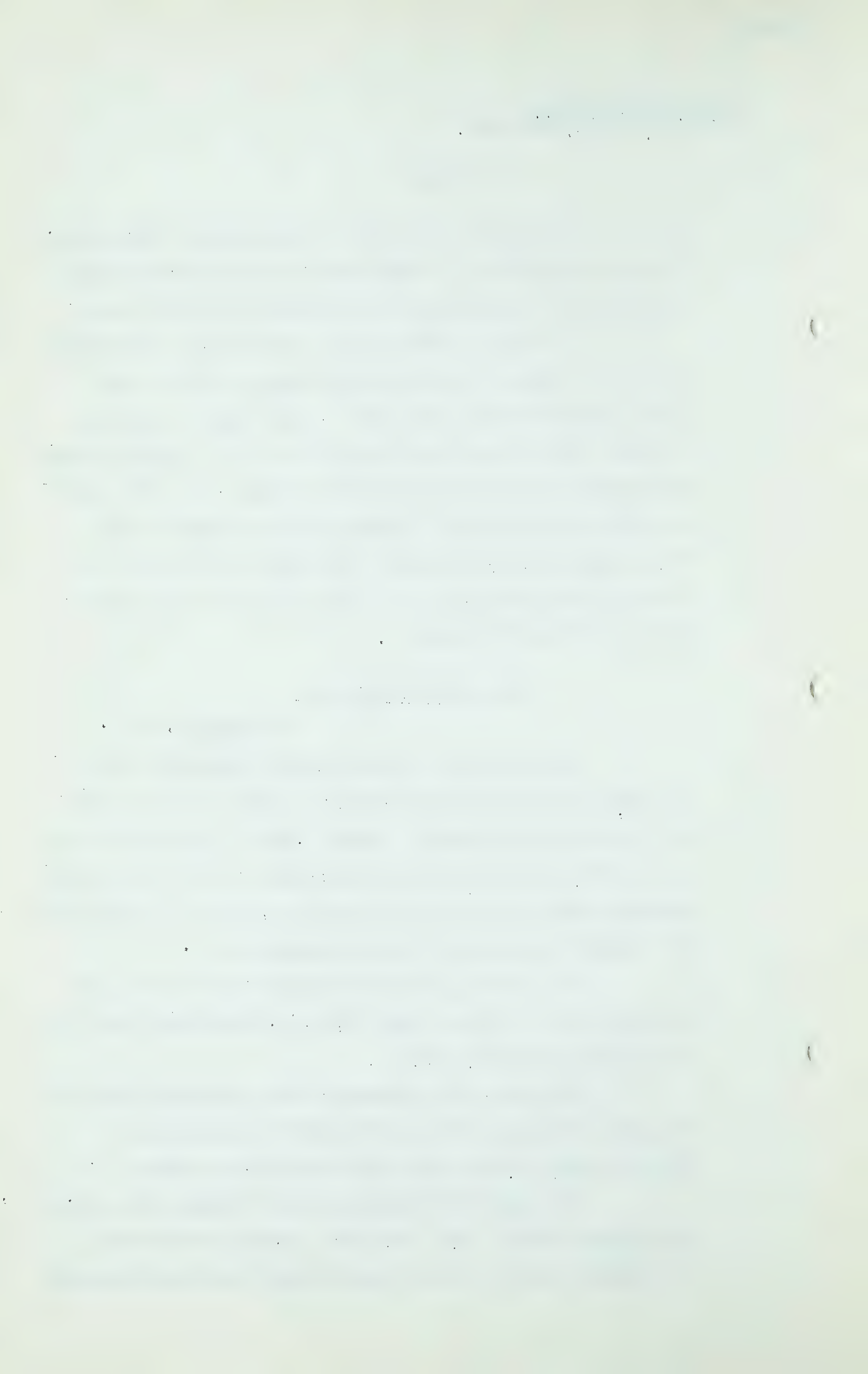
NOVEMBER, 1951.

The foregoing information was compiled a year ago, most of the statistical data including the year 1949 and in some cases previous years. Similar figures for the year 1950 have been obtained and indicate that the Greater Winnipeg District continues to grow, not only in population, but likewise industrially and commercially.

The latest population figures show the City of Winnipeg as of December 31st, 1950, as 238,604 and that of Greater Winnipeg, 373,012.

The value of manufactured and processed products produced within the Province in 1950 is estimated at \$525,000,000, an increase of \$42,000,000 over 1949.

New industries commenced from January 31st, 1950, to September 30th, 1951, total 52, running all the way from upholsterers, various needle trade industries through



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aluminum moulding, kitchen cabinets and the Standard Chemical Company with a new building costing \$125,000. Twenty-eight manufacturers have expanded in the year 1951, and 12 commercial businesses have done likewise. General Motors of Canada has purchased a hundred acre site within the City limits, and it is anticipated an Assembly Plant of some description will be erected there.

POWER SALES WITHIN GREATER WINNIPEG - TABLE C - Page 5.

Kilowatt hour sales for the year 1950 were 1,377,810,712.

MANUFACTURING INDUSTRIES, MANITOBA & CITY OF WINNIPEG - TABLES D, E & F - Pages 6, 7 & 8.

The latest figures in Manitoba industries show employees reported in December, 1950, are 41,755 and a weekly payroll of \$1,913,695.

In the City of Winnipeg, employees reported for the same period are 34,350 and the weekly payroll of \$1,539,050.

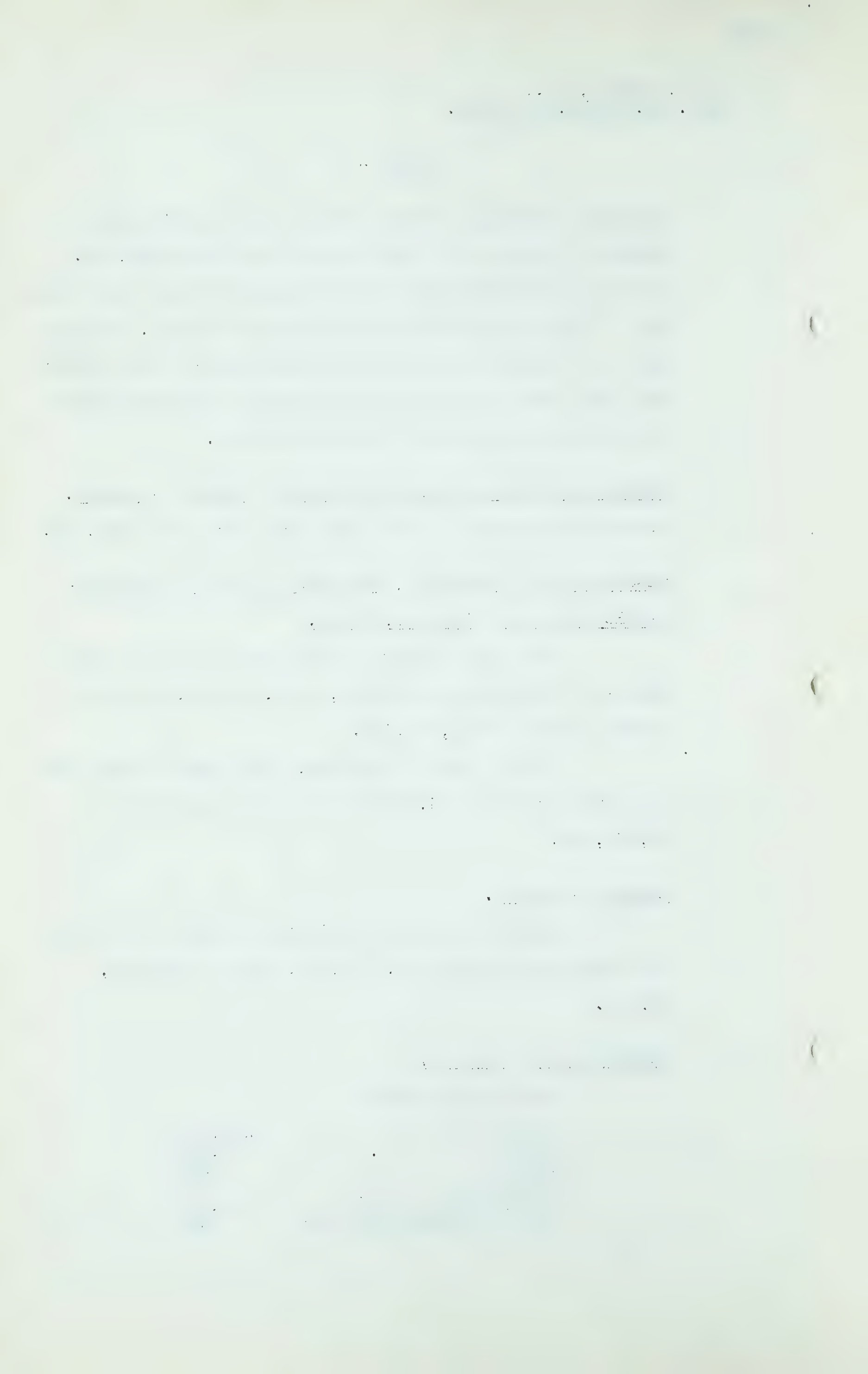
TABLE F - Page 8.

Employees in the 8 principal industrial groups for 1950 show in Manitoba, 119,002, and in Winnipeg, 76,094.

TABLES H & I - Page 12.

1950 figures show:

Population	238,604
Houses	1,315
Suites	201
Demolished	78
Total housing units	57,892
Avge. occupancy per unit	4.12



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TABLE I

Building Permits for 1950 for Winnipeg, 4,145 with a value of \$15,460,100, and for the suburbs, 1,730 permits, value \$14,470,740, with a total of 5,875 permits and a value of \$33,930,840.

SOLID FUEL CONSUMPTION - TABLES K, L, M & N -

Pages 14 to 21.

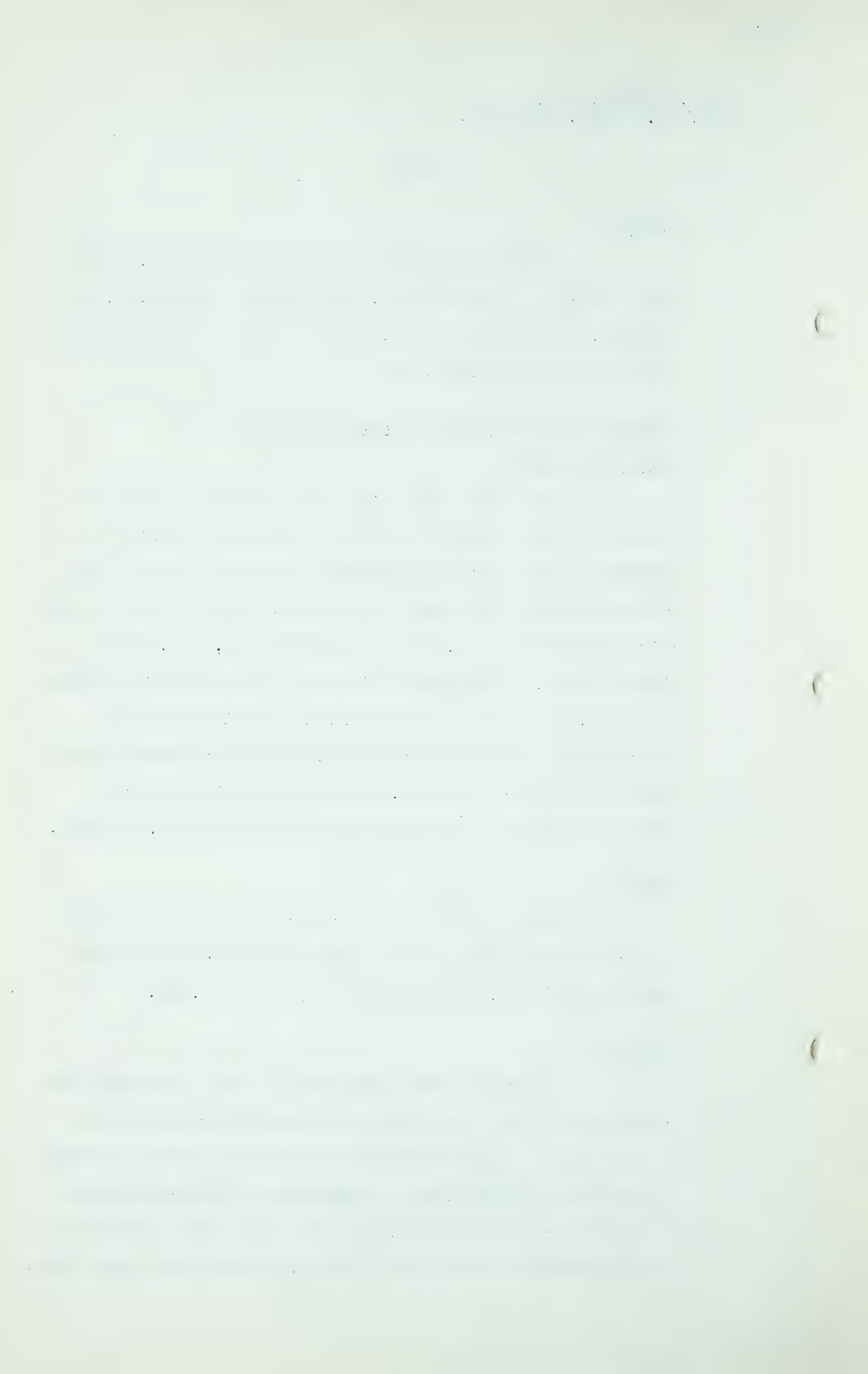
There are few significant changes in 1950 as compared to the previous years given in the Tables. The extremely cold winter of 1949-50 is evidenced by an increase in solid fuel sales reported by Retail Fuel Dealers of approximately 100,000 tons in Manitoba, 140,000 in Saskatchewan, with Alberta showing a decrease of approximately 12,000 tons. Industrial solid fuel showed some decreases in both Manitoba and Alberta with Saskatchewan showing a slight increase, the total for the Prairie Provinces being a decrease of approximately 170,000 tons.

TABLE M

Sales of solid fuel reported by Retail Dealers in Greater Winnipeg for the winter of 1950-51 increased approximately 43,000 tons to a total of 897,866.

TABLE N

Interprovincial shipments of coal available for consumption shows an increase in lignite production in Saskatchewan of approximately 330,000 tons with a decrease in Alberta's production of bituminous and sub-bituminous coal of approximately 500,000 tons, or a total reduction in Saskatchewan and Alberta of 170,000 tons less than 1949.



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The total production of 10,316,585 tons is, however, approximately one half million tons more than the total for 1948.

PETROLEUM FUEL - TABLE O - Page 23.

Consumption in Manitoba for 1949, the latest year on which figures are available, increased over 1948 from 44,949,000 to 50,529,000 Imperial gallons, most of this increase being for heating purposes. Heating fuel in Winnipeg and Brandon combined increased from 3,773,000 to 7,165,000 Imperial gallons during the same period.

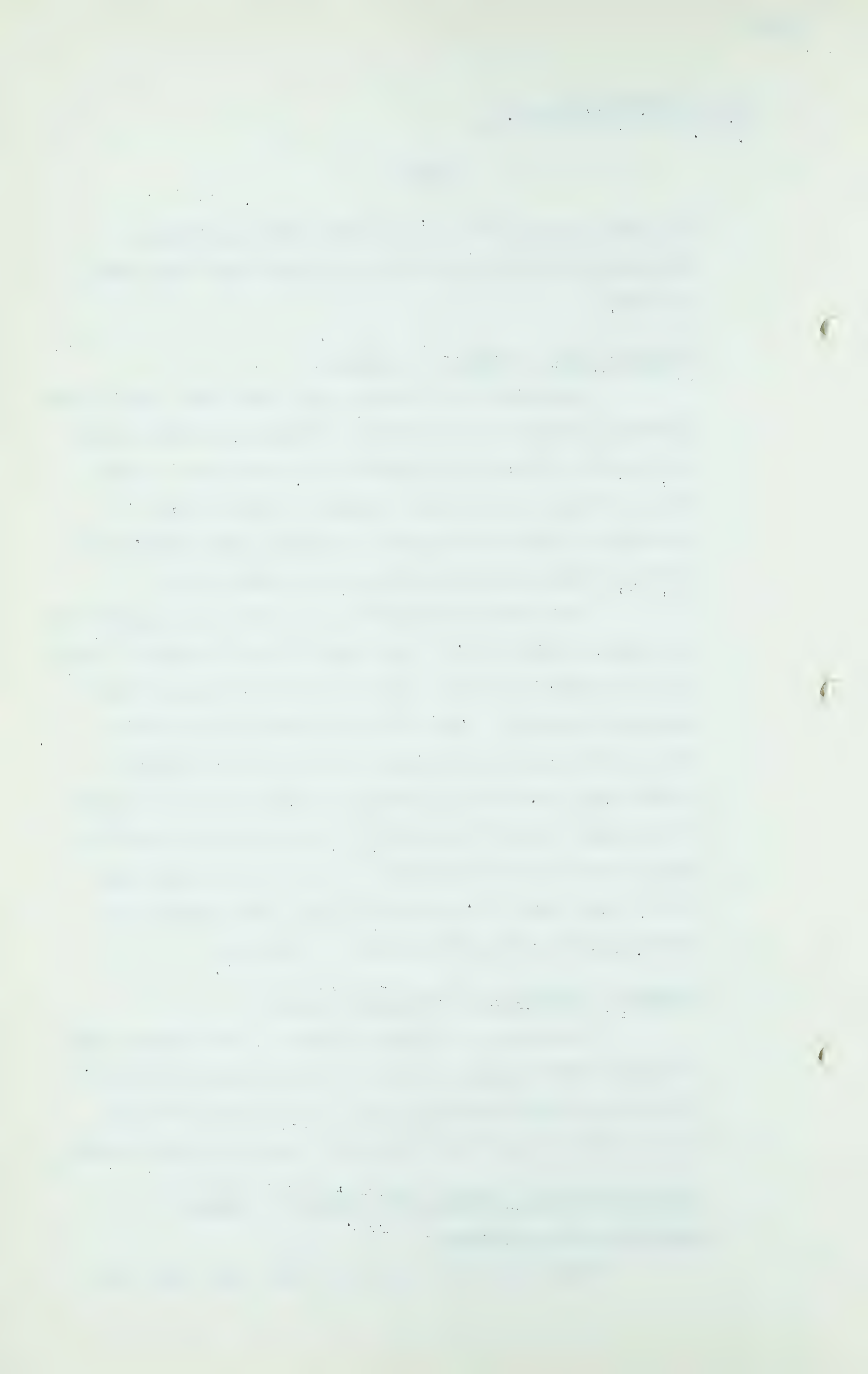
The coming into operation of the new Imperial Oil Refinery in East St. Paul just outside of Winnipeg is bound to show further increases in oil heating throughout the immediate District. Many of these installations are of the combination variety which can easily be switched to natural gas, and there is still no reason to believe that natural gas will not account for the majority of heating installations in this District once it is available and can be installed. There are no significant changes in central heating statistics shown on Page 24.

CLIMATE - TABLES R & S - Pages 26 & 27.

The winter of 1950-51 showed a total degree days of 10,879 with 76 days below zero and 20 days below -20°. The mean average temperature for the year was 32°, all pretty well in line with the 5-year figures already shown.

WINNIPEG ELECTRIC COMPANY, GAS UTILITY - TABLE T - Pages 30 to 33 inclusive.

Total cubic foot sales for the year 1950 were



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791,398,900 cubic feet, up 11,536,800 cubic feet from 1948. Residential sales were up approximately 5,000,000 feet, househeating 7,000,000, industrial 1,000,000 feet, and commercial down approximately 2,000,000 feet. Total revenues were up \$9,423 to \$768,600.

The rate schedule remains the same as shown on Pages 34 and 35.

Estimates of natural gas customers and firm sales for the first 5 years of operation remain unchanged. We can only again emphasize the extremely fertile field for the tremendous expansion of gas sales throughout the Winnipeg District with the advent of a pipe line to our immediate vicinity.

Q And then you have already mentioned, Mr. Harris, that in your supplement you bring some of those figures down to date?

A Yes, that is quite correct.

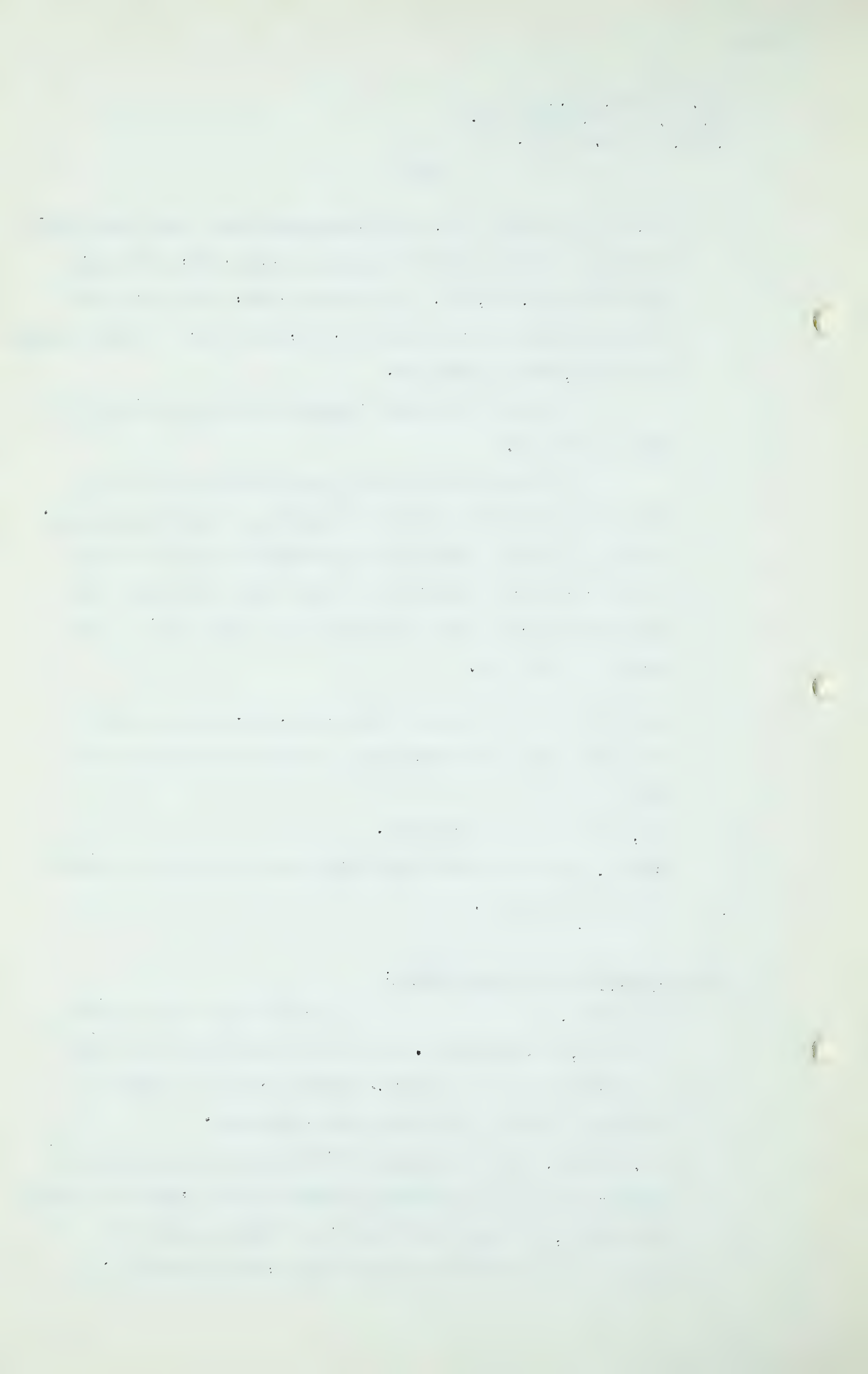
Q Thanks. Will you answer any questions that may be asked?

A I will do my best.

CROSS-EXAMINATION BY MR. NOLAN:

MR. NOLAN: I do not know why I always go first, Mr. Chairman. It can not be my seniority and it certainly is not my age. However, there is only one question I would like to ask this witness.

Q Mr. Harris, I have listened with interest to your careful market analysis as contained in Exhibit 105, and as I understand you, you think that there is a large market at present in Winnipeg for natural gas, and of course, a



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much larger potential?

A Yes, sir.

Q Gas has been offered to you and to your distribution system by Western Pipe Lines?

A It is pretty generally understood that if Western Pipe Lines is successful that they will have gas to offer.

Q And has it been pretty generally understood at what price they will offer you the gas for your distribution system?

A Not specifically, but I am given to understand that it will be somewhere in the vicinity of 31 to 33 or 34 cents.

Q There is nothing definite about that?

A Nothing definite yet.

CROSS-EXAMINATION BY MR. MILVAIN:

MR. MILVAIN: I have just two or three questions, Mr. Chairman.

Q I believe, Mr. Harris, that the Tables J to N, I think it is inclusive, deal with coal and other fuels?

A Yes, sir.

Q I am wondering what was the source of the information contained in those statements, Mr. Harris?

A Practically all of them were from the Dominion Bureau of Statistics, sir.

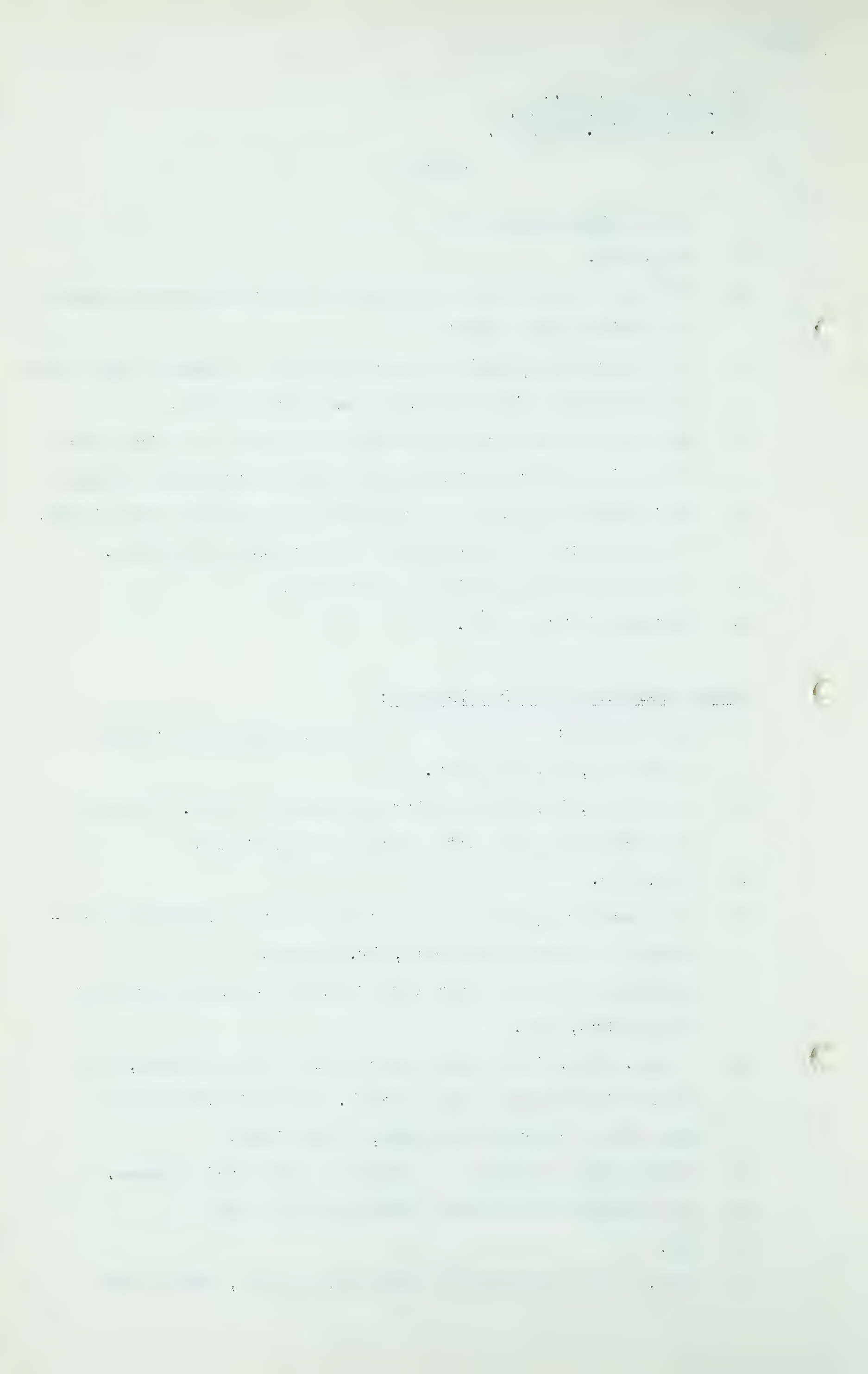
Q I see. Now, just considering Table J for a moment, you deal with various types of coal. At what efficiencies were those calculations made, do you know?

A There was no attempt to correlate efficiencies there.

Q No attempt to correlate efficiencies at all?

A No.

Q Now, I am looking now at Table W, that is, the one the



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estimate of natural gas customers and firm sales in the first 5 years?

A Yes.

Q Page 40. I notice that the figures that follow after large industrial sales, that would be in the second group from the bottom, you see?

A Yes.

Q Large industrial sales in the first year, 75,900; second year, 1,900,000, and so on across the page?

A Yes, sir.

Q Are these firm sales or interruptible sales?

A They could be either or both.

Q I wonder on what basis the estimate was made?

A It was made on the basis of a firm sale but we need some interruptible sales depending on the final rate structure we end up with.

Q You think you might end up by making some of those industrial interruptible?

A That is possible.

Q Now, is the cement plant referred to on page 43 of your text included?

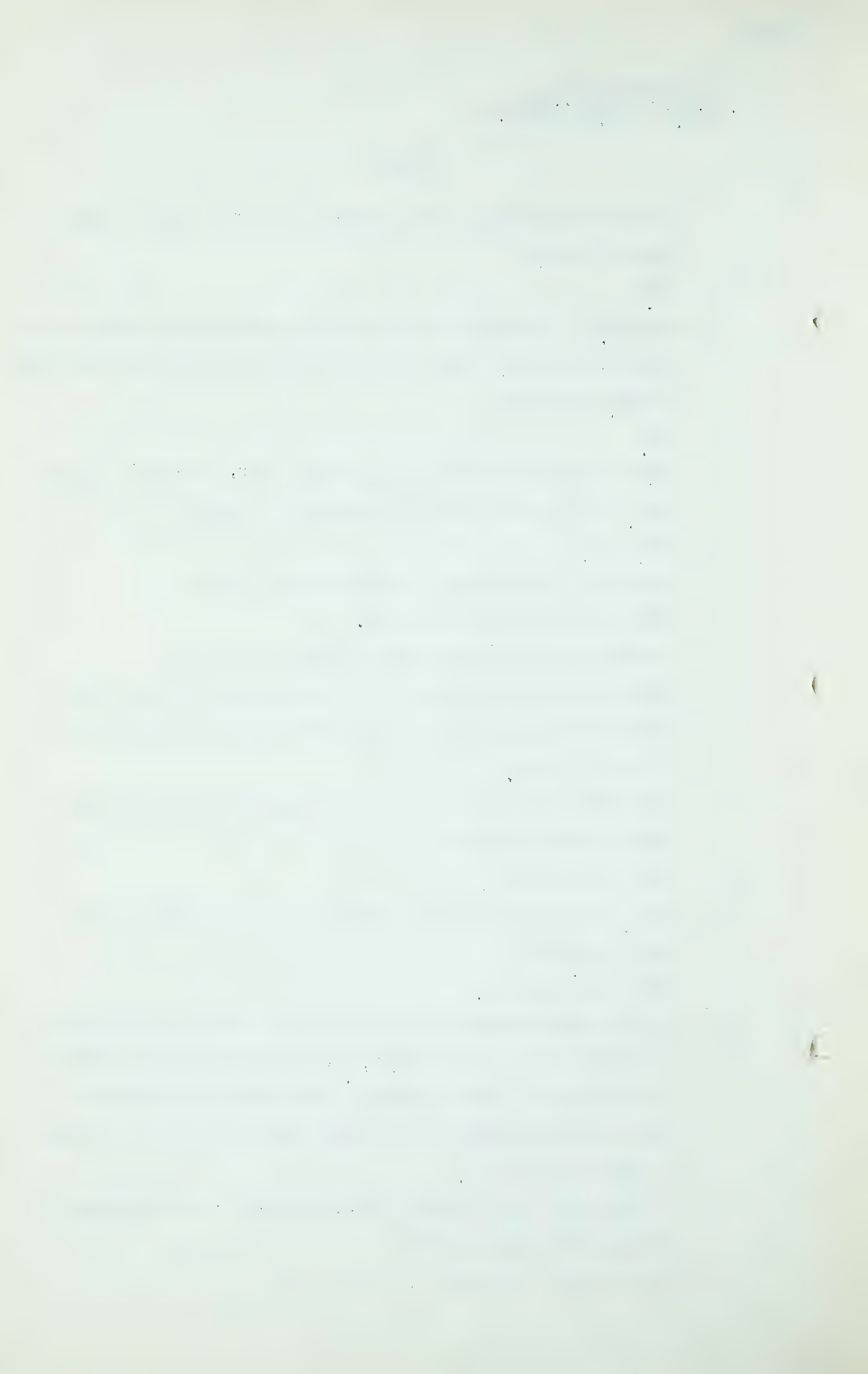
A That is included.

Q In the large industrial sales that are shown on Exhibit W?

A I mention that in the text, that that plant was included in there coming into operation some time in the second year and accounting for the large increase from 75 million to over 1 billion.

Q So when you jump from the 75,9 to 1,971, it is accounted for by this cement plant?

A That is quite correct.



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Q At the present time, I take it, the cement plant is using coal, as fuel, is it?

A They are preparing, if they have not already done so, to go to fuel oil. Whether that has actually taken place or not I really can not tell you.

Q At the present time they are using coal, is that the situation?

A I think so. They are about to change over. They may have changed over a few weeks ago and I have not heard of it. I heard that was in anticipation.

Q Whatever fuel they use, coal, oil or gas, will be used for what purpose, boiler heating?

A No, roasting cement, manufacturing cement.

Q And gas would not be necessary for that use?

A Well, they use coal, they are now going to oil. It requires a source of controllable heat, the more controllable the better.

Q So to their operating it is not a use that anticipates gas?

A No. You can presumably get by with wood if there were enough people to throw wood on.

Q As long as you get something that burns?

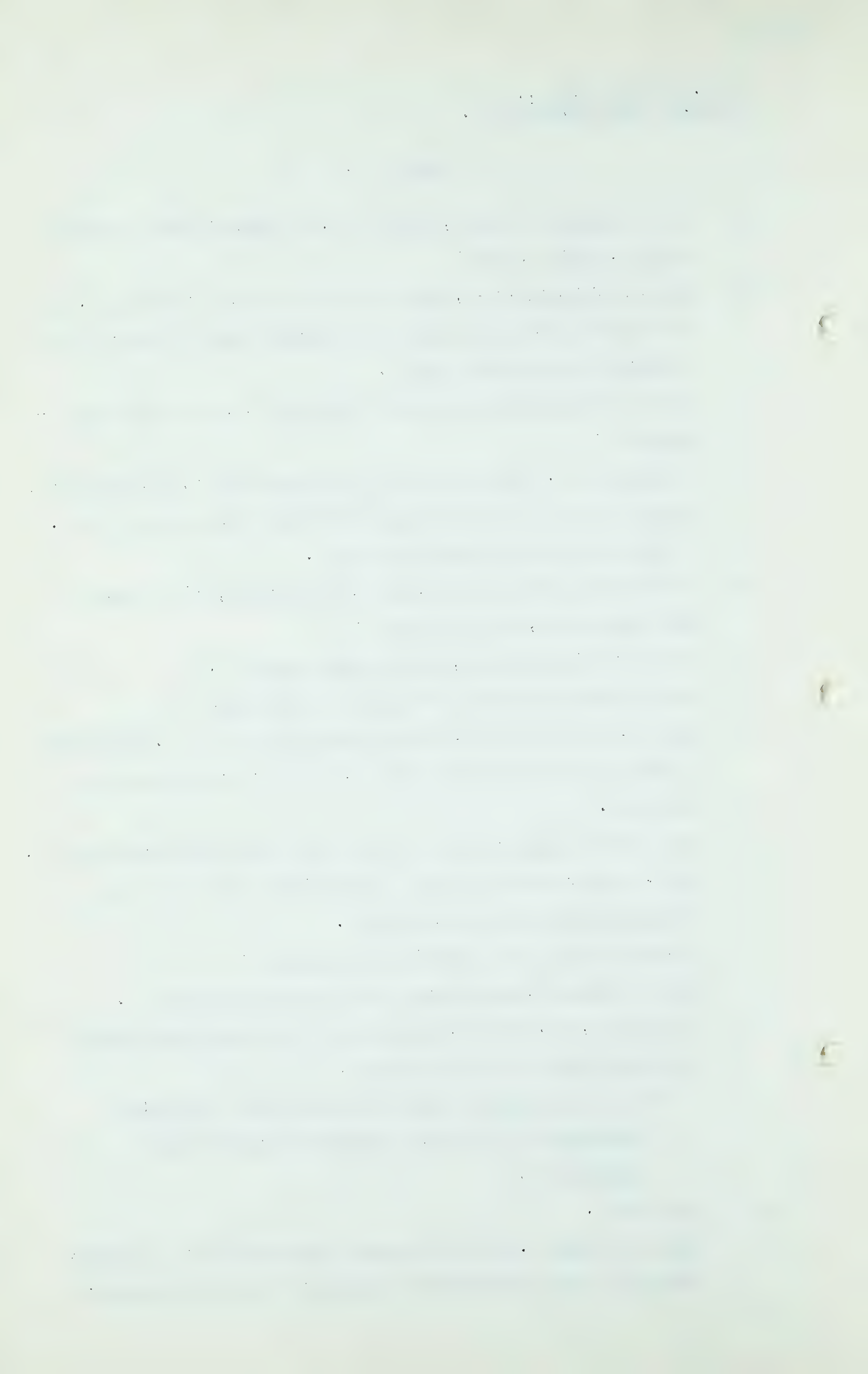
A That is right, and maintain the proper temperature.

Q I notice, Mr. Harris, on page 42 of your submission about six lines from the top you say:

"It is not expected that there will be a wholesale abandonment of present electric ranges in good condition."

A Yes, sir.

Q That is to say, you do not expect there would be a sudden conversion from the present appliances to gas appliances?



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Exam. by Mr. C.E. Smith.
Cr. Ex. by Mr. S.B. Smith.

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A No. If I myself had a brand new electric range I would think twice about it before throwing it away and buying a new gas range.

Q And I suppose, Mr. Harris, that unless you could be assured of a long range supply of gas you would think more than twice?

A With gas I doubt very much if anybody would bring gas unless they had a long-range supply.

Q That would be an essential qualification?

A Yes.

Q Otherwise, it would not be wise for a man to make a conversion if it was not economic to run the line?

A Nor to finance it.

EXAMINATION BY MR. C.E. SMITH:

MR. SMITH:

Just one question.

Q Mr. Nolan just directed a question to you about the question of price. I think he premised his question with the words "if Western brings gas". I take it if Delhi or anybody else brings gas you were in the same position, you want it?

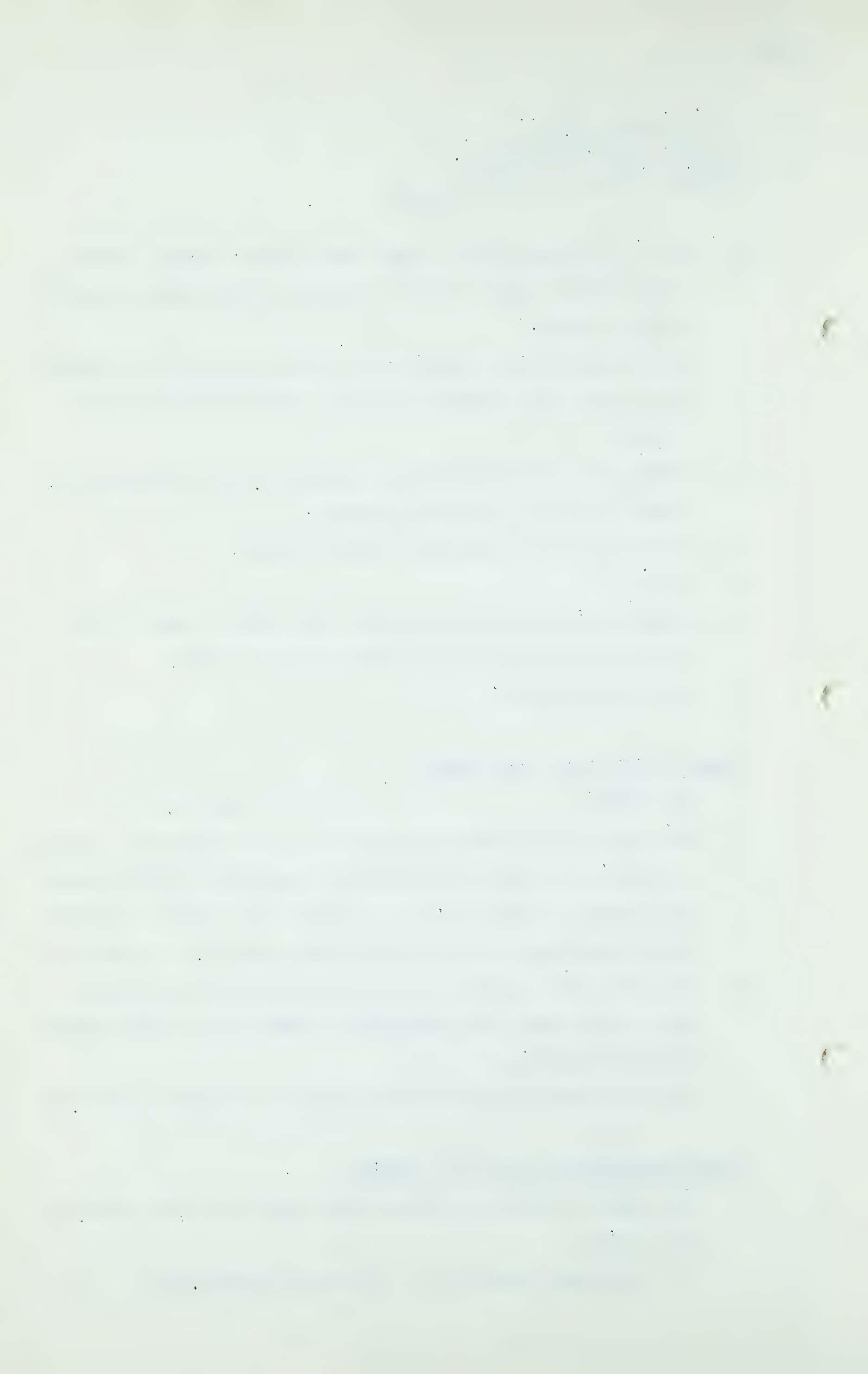
A We would want it, but I have no indication at the moment as to what Delhi would attempt to charge us, on what terms or anything else.

Q You just answered my question before I was able to ask it.

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Mr. Harris, perhaps somebody else asked you this, you say, at page 3,

"Winnipeg Electric is a private corporation."



A. H. Harris, Jr.,
Cr. Ex. by Mr. S.B. Smith.
Gordon Whitney,
Dir. Ex. by Mr. Martland.

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That was so, I guess, when this was prepared, it no longer is?

A It is still, at the moment.

Q It is in the process of being expropriated by the Province of Manitoba?

A There is a process in existence but whether it will involve expropriation of the company it still remains to be seen, sir.

THE CHAIRMAN:
Mr. Harris.

That will be all. Thanks

GORDON WHITNEY, having been
first duly sworn, testified as follows:

MR. MARTLAND: Mr. Whitney, sir, is presenting the exhibit entitled "Estimated Markets and Gas Requirements", and I would like to tender that now as an exhibit.

THE CHAIRMAN:

That will be Exhibit 106.

SUBMISSION OF STONE & WEBSTER
SERVICE CORPORATION ENTITLED
"ESTIMATED MARKETS AND GAS
REQUIREMENTS" PUT IN AND
MARKED EXHIBIT No. 106.

MR. MARTLAND:

The Board may recall, sir, that Mr. Whitney appeared here in September about a year ago and presented his qualifications at that time.

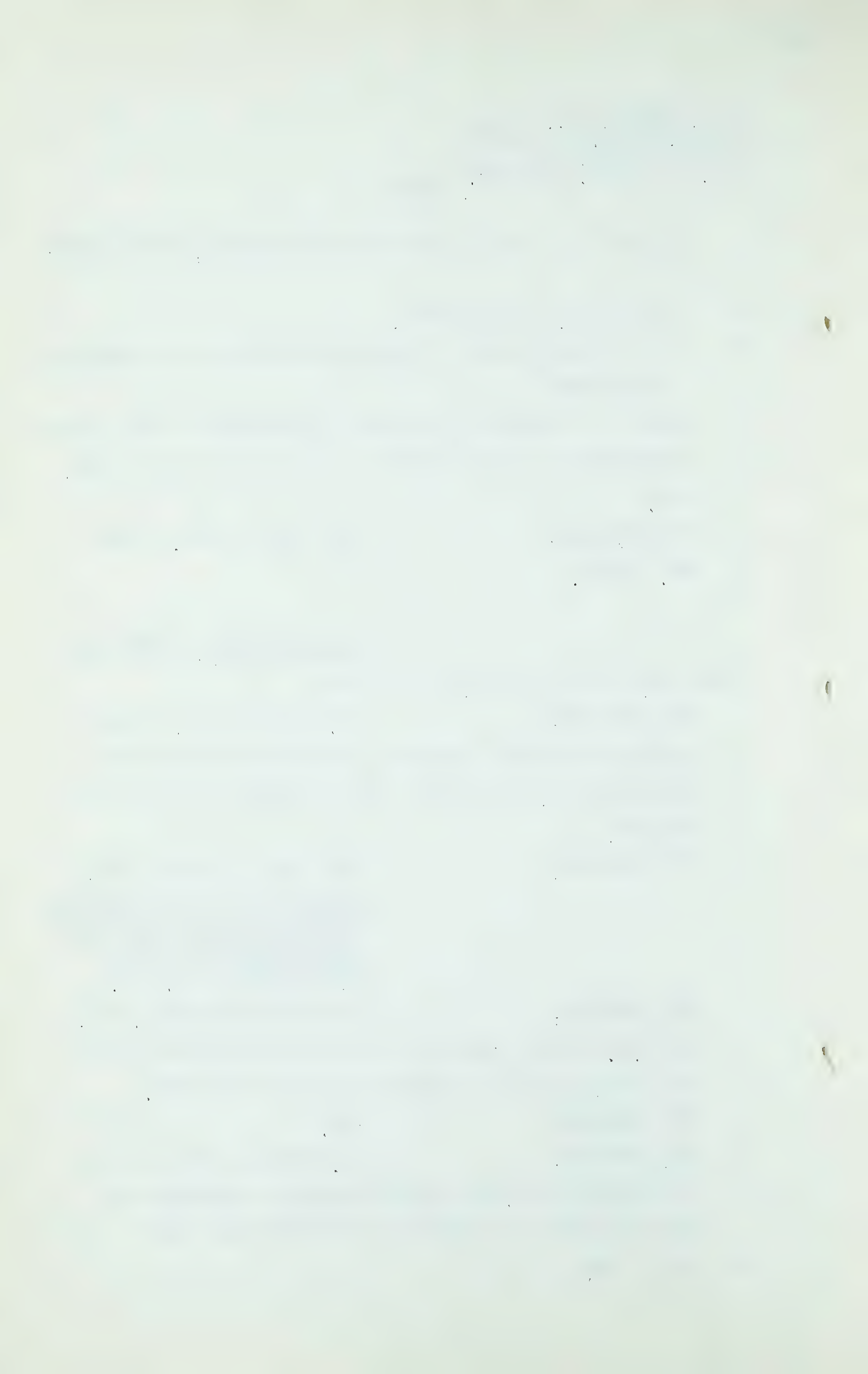
THE CHAIRMAN:

Yes.

Q MR. MARTLAND:

Mr. Whitney, are you still associated with Stone & Webster Service Corporation as you were when you presented your report last year?

A Yes, I am.



Gordon Whitney,
Dir. Ex. by Mr. Martland.

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Q And you have prepared this exhibit entitled "Estimated Markets and Gas Requirements" which is not Exhibit 106?

A Yes, I have.

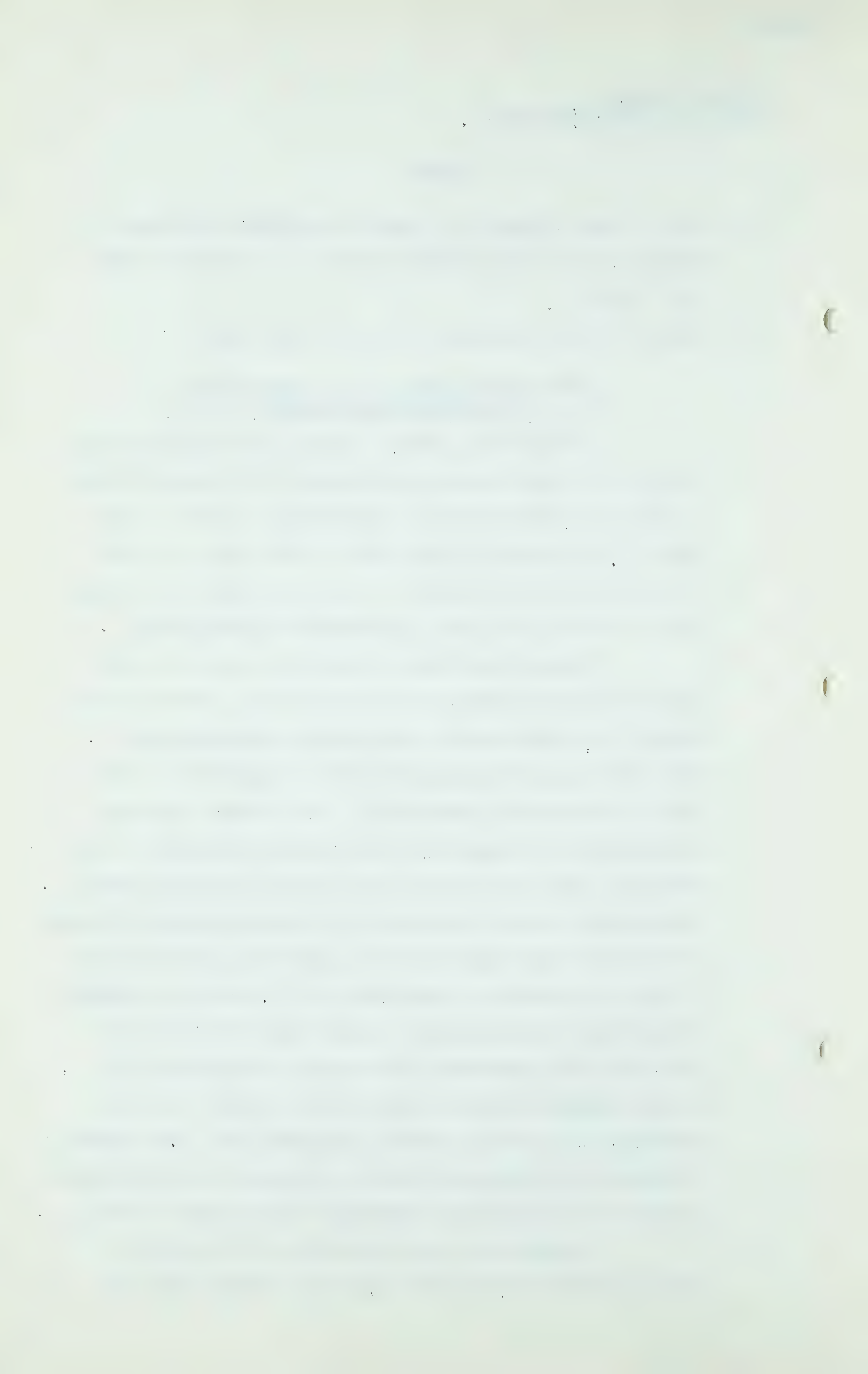
Q Would you please present that now to the Board?

A ESTIMATED MARKETS AND GAS REQUIREMENTS
OF WESTERN PIPE LINES

In September, 1950, a report was submitted describing the market areas which Western Pipe Lines proposes to serve and indicating the estimated gas sales in those areas. This report is submitted to incorporate certain revisions in the project and to provide additional information concerning the gas requirements of the system.

Western Pipe Lines currently proposes to serve the same Canadian areas as described in the previous submission, the main markets being Regina and Saskatoon, Saskatchewan, and Winnipeg, Manitoba. Population of the areas is tabulated in Appendix I. The primary business of the Pipe Line Company will be wholesale service to distributing utilities at the borders of the various cities. The estimated retail customers of the distributing utilities at the end of the first and fifth operating years is shown by classes of service in Appendix II. Estimates of annual and peak day demands of the various communities for the first and fifth operating years appear in Appendix III, and the corresponding estimated sales of gas to the distributing utilities are shown in Appendix IV. The figures in Appendix IV anticipate that the demands of all customers except the interruptible industrials will be met in full.

In addition to the deliveries to be made to Canadian areas, Western Pipe Lines has entered into an



Gordon Whitney,
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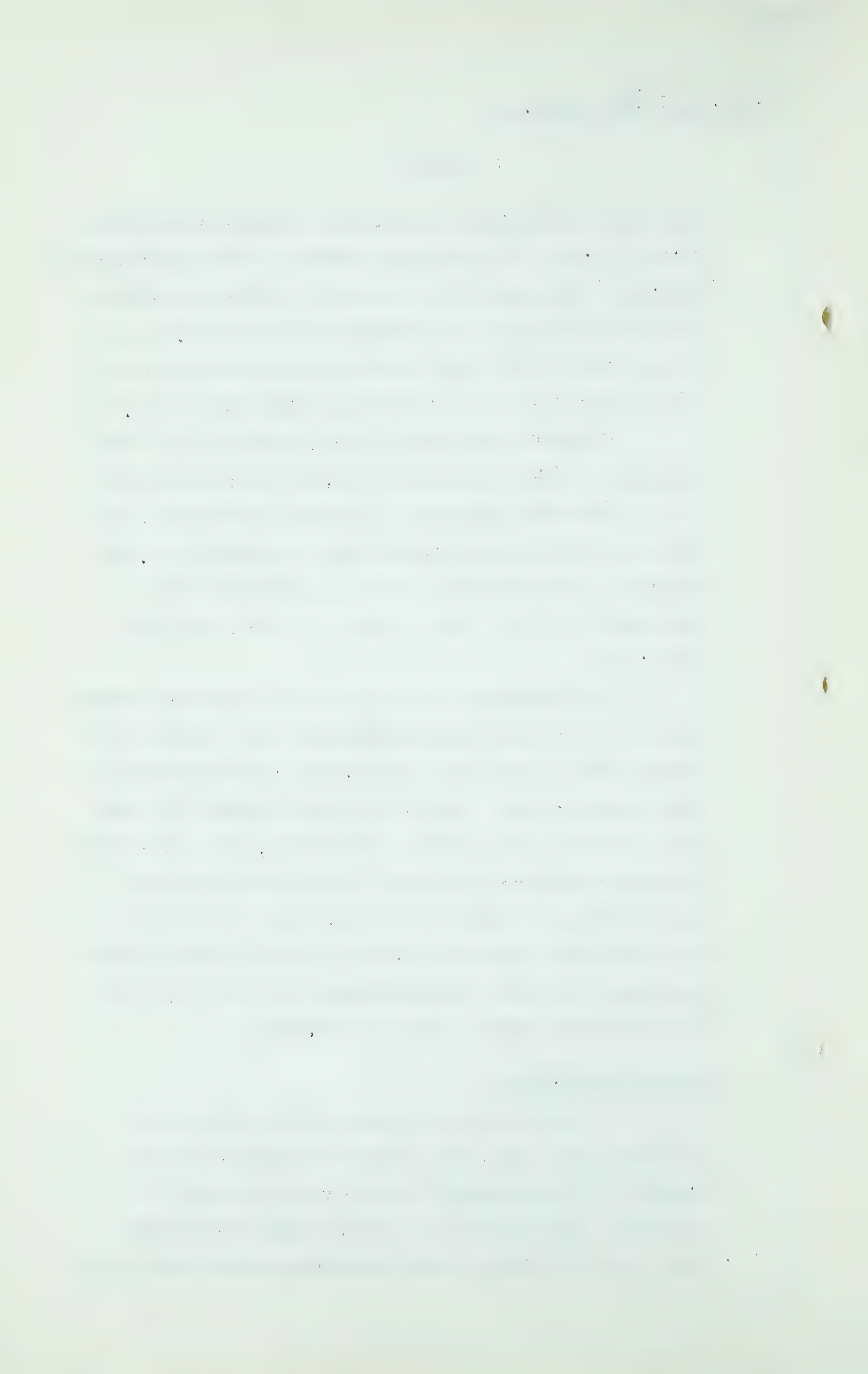
agreement with Northern Natural Gas Company for the sale of 150,000 Mcf. of natural gas per day at the International Boundary. This gas would be re-sold by Northern Natural for consumption within the United States of America. It is expected that the load factor of this sale will be as close to 100 per cent as operating conditions will allow.

While there have been some changes in the fuel situation in the Canadian market areas, the changes are not of sufficient magnitude to adversely affect the competitive position which natural gas is expected to have. Therefore, the market for gas in the Canadian areas is considered to be the same as set out in the previous submission.

The principal use of gas in the Canadian communities will be domestic and commercial space heating with lesser amounts to be used for cooking, water heating and other general uses. There is a limited market for high-grade industrial fuel within the market areas, and natural gas should be able to capture a major portion of this business within a relatively short time. In addition to this high grade industrial market, there are three power generating stations in Saskatchewan to which service on an interruptible basis should be feasible.

Present Gas Service.

The only operating gas utility within the Canadian area is the gas system of Winnipeg Electric Company. This system distributes coke-oven gas to a relatively small portion of the Winnipeg metropolitan area. At the present time, the system serves about 15,000



Gordon Whitney,
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customers.

The City of Brandon, Manitoba, had gas service prior to 1949 from a small coal gas plant, but the system has been withdrawn from service and all customers converted to electricity. It will probably be necessary to construct a new distribution system in this city.

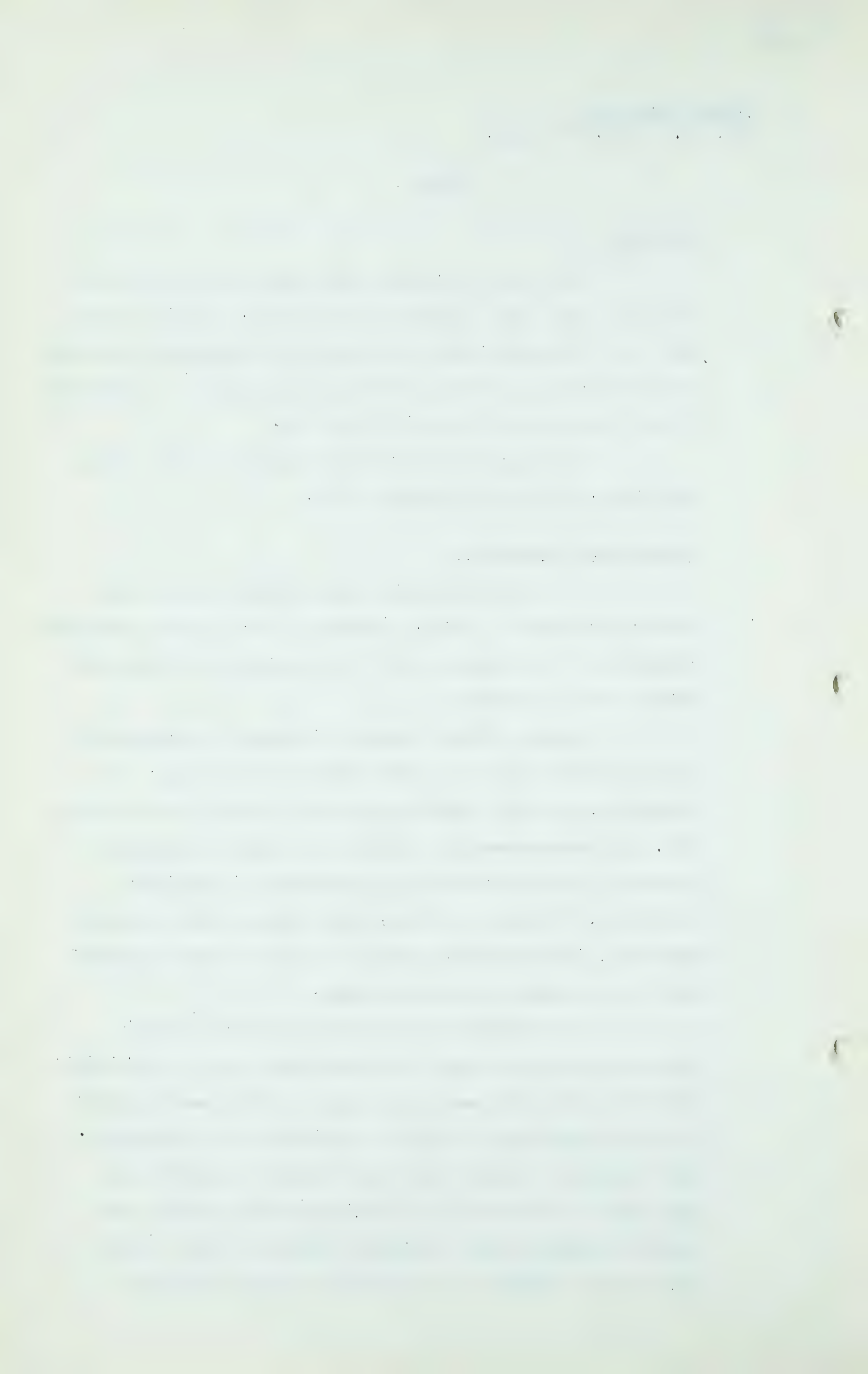
There are no distribution systems in the other Canadian cities at the present time.

Competitive Conditions

In all Manitoba and Saskatchewan cities which Western proposes to serve, electricity will be the principal competitor of natural gas for the residential cooking and water heating business.

Nearly all the power distributed in Manitoba is hydro-generated and the retail rates are very low. Consequently, electric cooking and water heating are in common use. In Saskatchewan the major portion of the power is generated and distributed by provincial or municipal utilities. Electric service, while higher priced than in Manitoba, is inexpensive enough to allow its wide acceptance for cooking and water-heating.

The following tabulation summarizes for the three major market areas the approximate cost of electricity for cooking and water heating and indicates the price at which natural gas would be equivalent to electricity. The comparison assumes that the thermal consumption of gas would be twice that of electricity for cooking and one and one-half times for water heating. Where block rates are in effect, it is assumed that the first 100



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kilowatt hours per month would be the average use for lighting and other small appliances, and the next 150 kilowatt hours would represent the cooking load. The water heating consumption is assumed to be 350 kilowatt hours per month and to occur for pricing purposes after 250 kilowatt hours of use for other purposes.

There follows a table which shows the comparative rates and the comparable price of gas in Winnipeg, Regina and Saskatoon.

(Go to page 2967)

Gordon Whitney,
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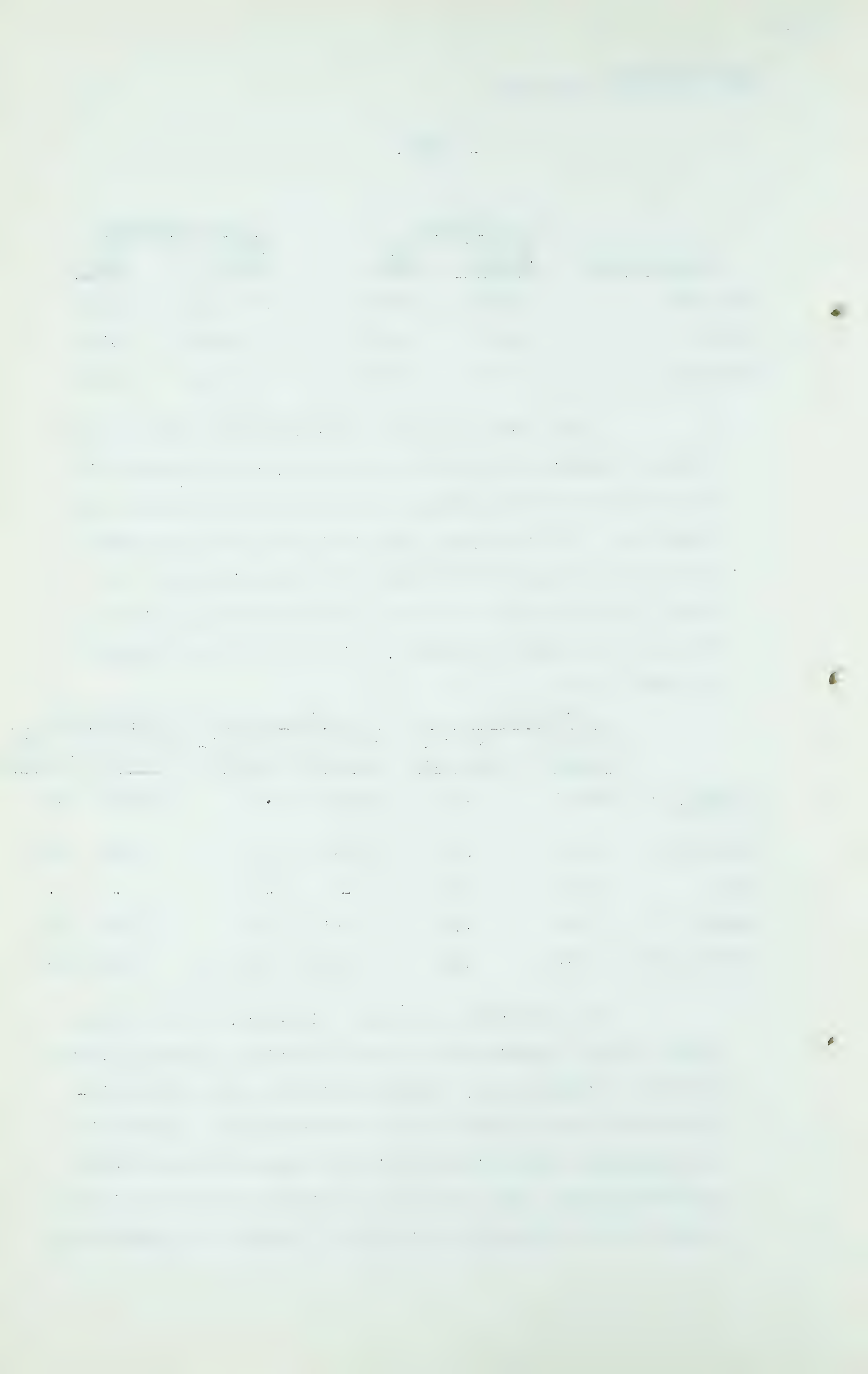
- 2967 -

<u>Market Area</u>	<u>Cooking</u>		<u>Water Heating</u>	
	<u>Electric</u> <u>¢/kwh</u>	<u>Gas</u> <u>\$/Mcf</u>	<u>Electric</u> <u>¢/kwh</u>	<u>Gas</u> <u>\$/Mcf</u>
Winnipeg	0.90	1.32	.90	1.76
Regina	1.43	2.09	1.43	2.79
Saskatoon	1.90	2.78	1.44	2.81

The cost of fuel for space-heating varies in the various communities of the service area, but in general it may be said that high-grade fuels for domestic heating are expensive. The following table indicates the approximate cost of some major heating fuels for domestic use. The table indicates the per ton or gallon and the per million BTU cost of Drumheller Stoker, Briquettes, Coke, Lignite, and #2 Fuel Oil.

	<u>Winnipeg</u>		<u>Regina</u>		<u>Saskatoon</u>	
	<u>Per ton</u> <u>or gal.</u>	<u>Per mil-</u> <u>lion Btu</u>	<u>Per ton</u> <u>or gal.</u>	<u>Per mil-</u> <u>lion Btu</u>	<u>Per ton</u> <u>or gal.</u>	<u>Per mil</u> <u>lion Btu</u>
Drumheller Stoker	\$14.75	\$.76	\$11.50	\$.59	\$12.30	\$.63
Briquettes	20.65	.80	19.10	.73	18.10	.70
Coke	24.30	.94	-	-	-	-
Lignite	9.40	.61	7.65	.50	6.65	.43
#2 Fuel Oil	0.166	.98	0.162	.95	0.198	1.16

For industrial purposes, high-grade fuels such as light oil and bituminous coals are relatively expensive, but lignite is inexpensive, readily available and quite satisfactory for use in modern boiler installations. Light oil in industrial quantities is priced at approximately 80-90¢ per million Btu, while the cost of bituminous coal is in the order of 45 to 60¢ per million Btu. The cost of lignite for



Gordon Whitney,
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industrial purposes varies between 24¢ and 30¢ per million Btu at various points along the pipe line route. Bunker "C" oil is becoming increasingly important as an industrial fuel in the area to which service is proposed and its price varies from 28¢ to 36¢ per million Btu depending on location, quantities and other factors.

Residential and Commercial Markets

Appendix II tabulates by classes of service the estimated number of customers which will be connected to the various distribution systems at the end of the first and fifth years of operation.

Population trends in each of the areas have been studied and the residential customers have been estimated as a percentage of the estimated dwelling units in each of the service areas. At the end of five years, it is estimated that in the Saskatchewan cities, 52 per cent of the dwelling units will be connected to the gas mains. In Manitoba the corresponding factors are 55 per cent for the Winnipeg service area and 48 per cent for the other cities. Residential heating customers have been projected as a percentage of the total residential customers. These percentage estimates vary from approximately 43 per cent in the Saskatchewan cities to 48% in Brandon, Manitoba after five years. Commercial and small industrial customers have been related to residential customers in the ratio of one to ten.

G. Whitney,
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Appendix III presents the estimated demands of the various classes of customers and Appendix IV is an estimate of the sales by areas. The figures shown in these Appendices are the result of applying estimated unit consumption figures to the estimated customers shown in Appendix II. The estimated unit consumptions in the major market areas are tabulated below.

There is a tabulation for the Mcf. per customer per year in the first and fifth years for Winnipeg, Regina, and Saskatoon.

Industrial Market

It has been pointed out that high-grade fuels for industrial purposes are relatively expensive throughout the pipeline service area. It is expected that gas can replace high-grade coal and light oil for processing work such as heat-treating, malt-drying, and kiln operations. The firm industrial demand shown in the market estimates represents the present high-grade fuel consumption of the existing industries in the communities to which service is proposed.

In addition to the firm industrial load outlined above, the steam generating plants of the Saskatchewan Power Corporation at Saskatoon and Prince Albert, and the municipal power plant at Regina, are considered excellent prospects for the off-peak sale of gas. The consumption of these three power stations is the interruptible industrial demand shown in Appendix III. The actual amount of gas which the pipe line will be able to deliver to these locations is indicated in Appendix IV.



G. Whitney,
Dir. Ex. by Mr. Martland

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There follows Appendix I, which is a tabulation of the population figures of the various cities totalling 494,459. This is the 1946 census.

Appendix II is the estimated customers by classes for each city at the end of the first year of operation, and at the end of the fifth year of operation.

Appendix III is the estimated annual maximum day demands by classes of use for the first year and the fifth year of operation. These figures represent the total demand as compared with sales, which are presented in Appendix IV, which appendix indicates the total sales and the total requirements for the first and fifth years.

Appendix V is a table showing pertinent weather data for four of the main market areas.

Q Are there any special comments you want to make with regard to any of those Appendices, Mr. Whitney?

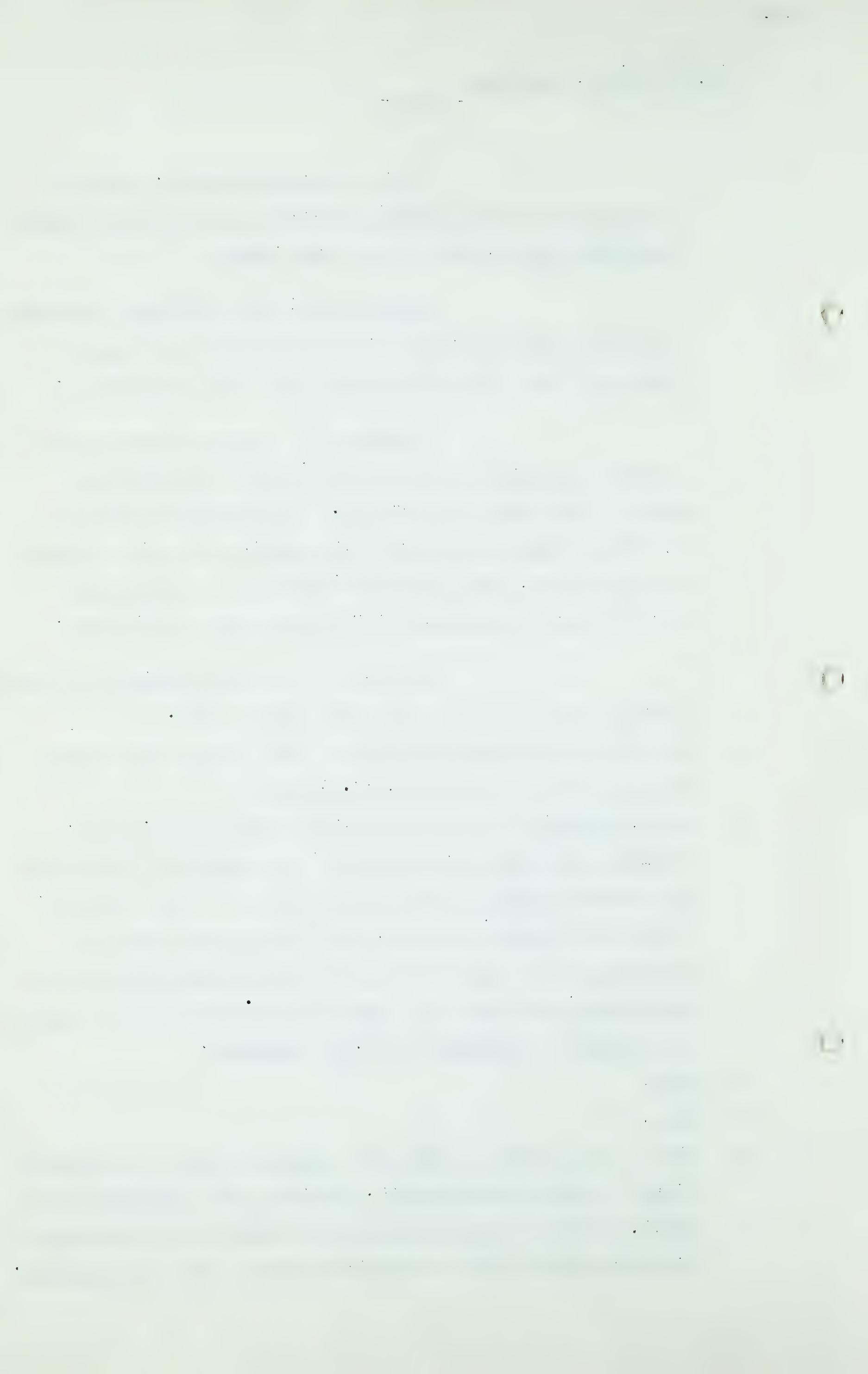
A Well, Appendix II, in connection with the Winnipeg area, I might just point out that that is the location of the only gas service company at the present time. It now has something over 16,000 customers, and in the system there are something on the order of nine to ten thousand dead services, indicating that there is a system there at the present capable of serving on the order of 25,000 customers.

Q Now?

A Now.

Q Yes. Did you want to make some comments about the industrial loads in Winnipeg and Regina, referring now to Appendix III?

A Well, I think the text indicated the nature of the interruptible industrial loads in Saskatoon, Prince Albert and Regina.



G. Whitney,
Dir. Ex. by Mr. Martland
Cr. Ex. by Mr. Nolan

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The firm load in Winnipeg, I think, was covered pretty well by Mr. Harris. He mentioned the cement plant, the malting plants, and various fabricating shops, and the railroad ships, which are potential industrial customers.

Q And referring to Appendix IV, have you worked out the percentage of the annual quantity of sales to the United States as compared to those in Canada, out of the total annual sales, fifth year?

A Yes, I have those figures. On a peak-day basis, the sales to Northern Natural represents 57% of the total, indicating that some 43% of the pipe line capacity is dedicated to Canadian markets, and on an annual basis, 26% of the total sales goes to Canadian markets.

Q Thanks, Mr. Whitney, would you answer my learned friends?

.....

CROSS-EXAMINATION BY MR. NOLAN:

Q Mr. Whitney, just one or two things perhaps you could help me with. It is quite clear, is it not, that this project of Western Pipe Lines is not economically feasible unless we have the Northern Gas contract to back it up?

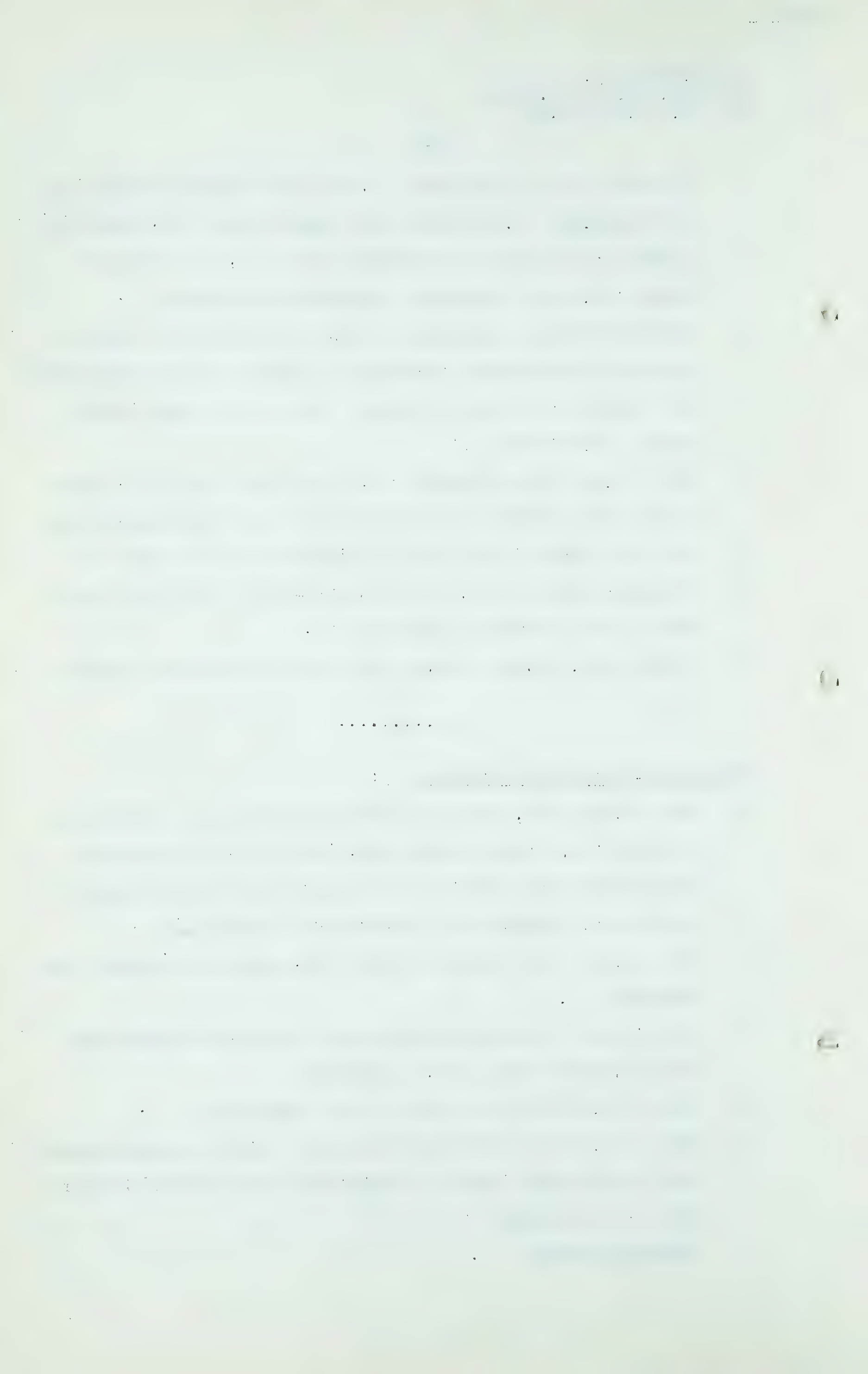
A Oh, I think that was part of Mr. Williamson's statement this morning.

Q I know, but I want you to give me your opinion about what Mr. Williamson said, as an engineer?

A Well, I would hate to write it off completely.

Q Well, let me put it to you this way: Would you much rather see this project carried through with the Northern Gas contract than without?

A Certainly would.



G. Whitney,
Cr. Ex. by Mr. Nolan

- 2972 -

Q And we learned this morning that there is no price in that contract, that price has to be negotiated?

A That is what I understand, yes.

Q Now, perhaps you will tell me this, you have made a study, you show here, on a possible connection of the marketing area, that would be served by Western Pipe Lines. Would it not be a fact that in estimating the merits of these various projects you would have to take into consideration the marketing areas which they would respectively serve? I am putting you in the position of the Board, Mr. Whitney, you are deciding amongst three or four or five applicants as to who shall get a permit, and one of the things you would consider would be the market that is available to Applicant A, to Applicant B, and to Applicant C?

A I would certainly say it has a bearing on any consideration of the project.

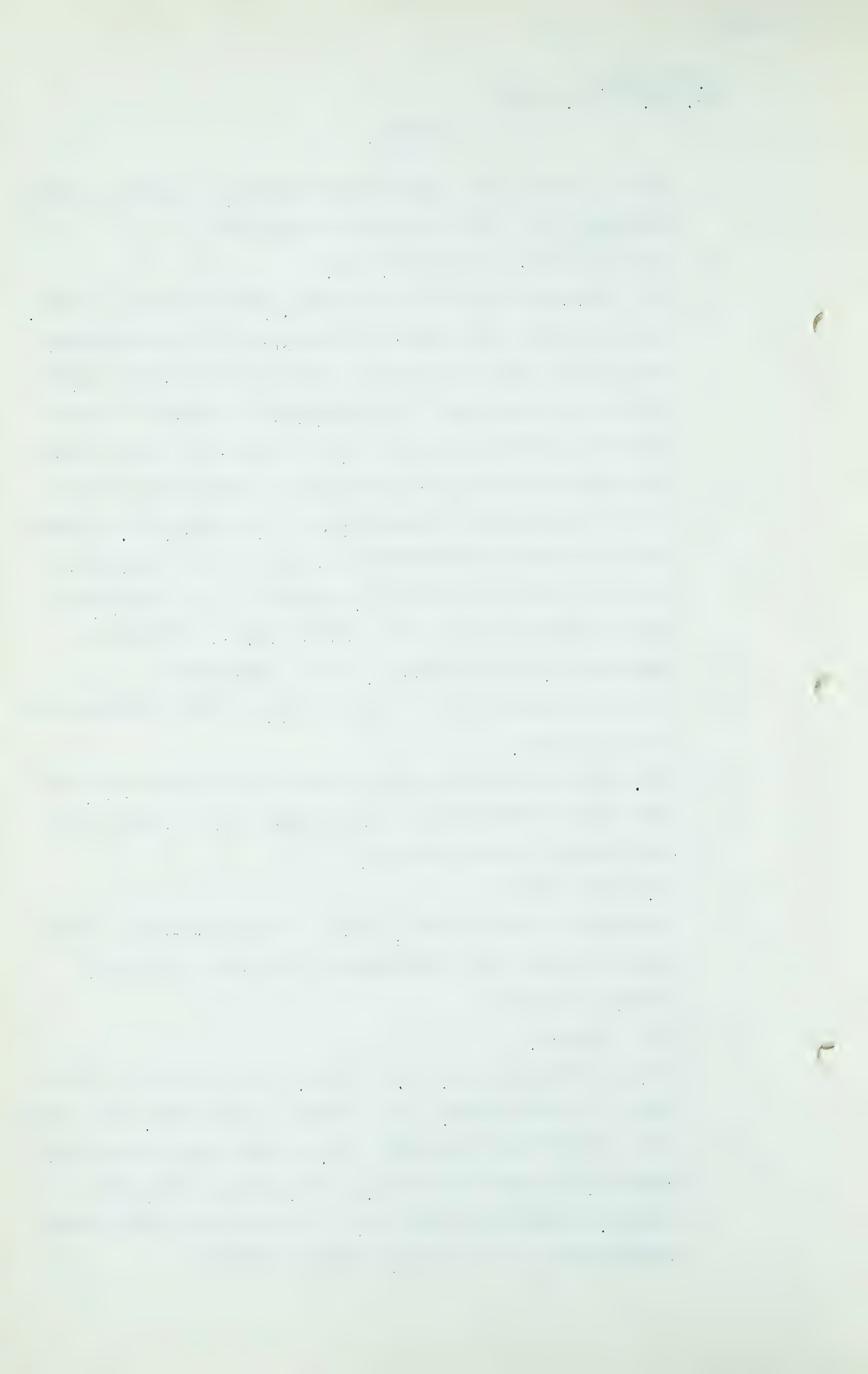
Q Yes. And do I take it that you have had no opportunity and have had no instruction to investigate what I might call the Pacific Northwest market?

A No, I have not.

Q You have not investigated, then, the potentialities of an industry such as the Consolidated Smelting & Mining at Trail, have you?

A No, I haven't.

Q Now, I notice you say, Mr. Whitney, that in some of these areas in Saskatchewan, and I suppose in Manitoba, too, there are no distribution systems. Mr. Harris has told us about Winnipeg. We know about that. But, let us take, for example, Regina and Saskatoon. They have no distribution system there at the moment, that is correct?



G. Whitney,
Cr. Ex. by Mr. Nolan

- 2973 -

A No, no gas distribution system.

Q And that is what I meant, no gas distribution system?

A Yes.

Q What would be proposed to be done there? Would Western Pipe Lines serve that community itself, or would there be a distribution system set up, or how would you go about it where there is no existing system?

A Well, Western Pipe Lines' business would be the wholesale service to the city gate.

Q And who would take it at the city gate?

A It is assumed that there would be distribution companies set up for that purpose.

Q Separate and apart from Western Pipe Lines?

A Yes, separate and apart from Western Pipe Lines.

Q They are the retailer and Western Pipe Line is the wholesaler?

A That is correct.

Q Now, what would the price be between that wholesaler and that retailer at that gate?

A The price has not been determined.

Q Well, there has been some discussion with the Winnipeg distribution system, Mr. Whitney, because I got some figures from Mr. Harris, and I think there were figures ranging between 31 to 33 or 34 cents?

A That is what I understood him to say, yes.

Q Are those the figures, or did I misunderstand him?

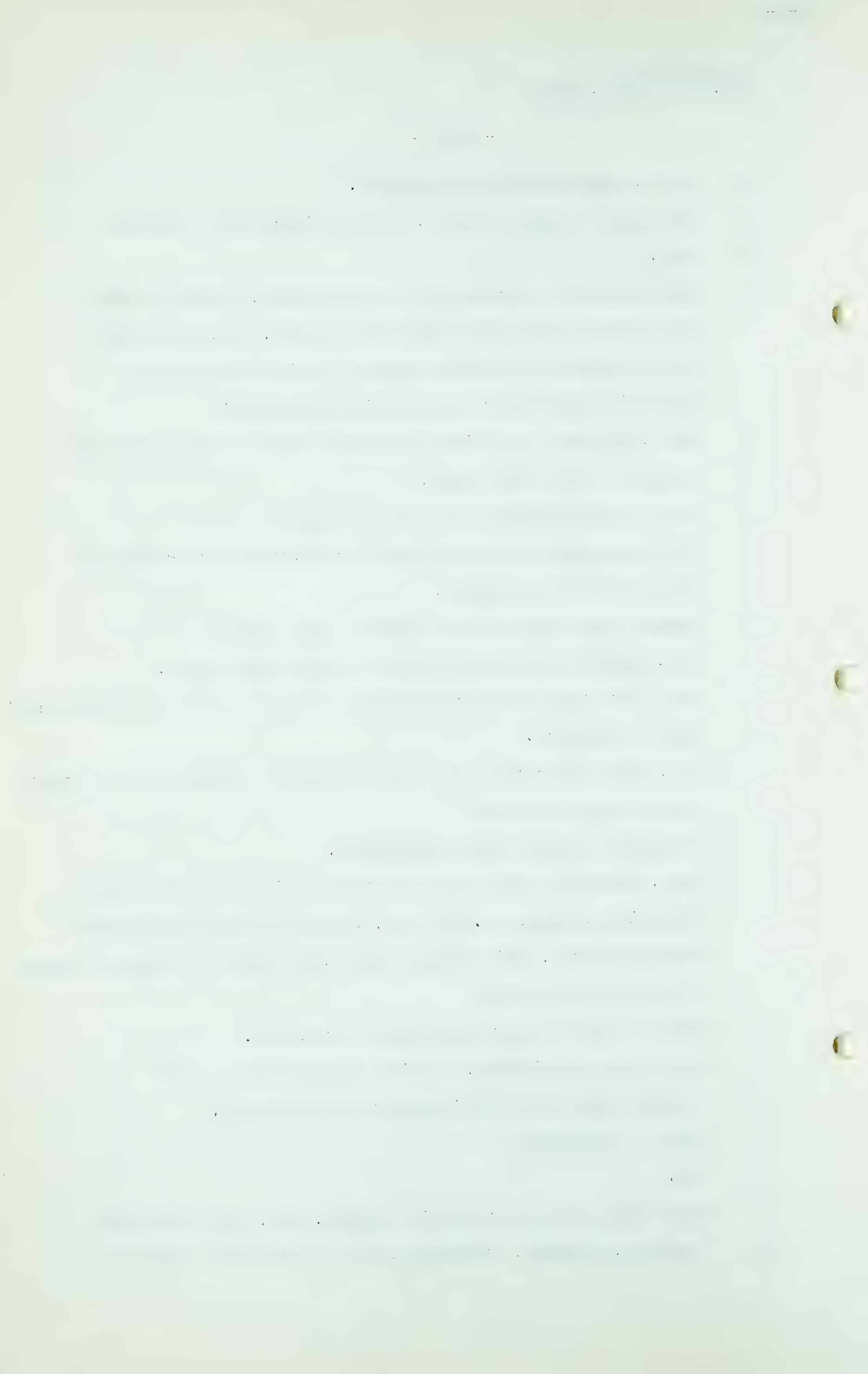
A I think those are the figures that he quoted.

Q That is the range?

A Yes.

Q Could you give me a range for Regina, say, and Saskatoon?

A I may be, perhaps, jumping ahead a little, but some of



G. Whitney,
Cr. Ex. by Mr. Nolan

- 2974 -

our other material will present the economics of the pipe line, and will show the estimated costs of the service on the pipe line system.

Q But have there not been any negotiations opened, even though they are not in the form of a concluded contract between the wholesaler, that is, the Western Pipe Lines, and any retailer who is proposing to distribute in those cities? I take them only for example, Regina and Saskatoon.

A Not as far as I know. There have been no negotiations in that respect, as far as I know. As a matter of fact, it is expected that the Province of Saskatchewan will be the distributing agency in the Saskatchewan cities.

Q Yes. I wondered about that. Would that be true of all cities and towns in Saskatchewan served by Western Pipe Lines?

A I think so, yes.

Q How far have they got in their determination to take over the distribution, or do you know?

A I do not know.

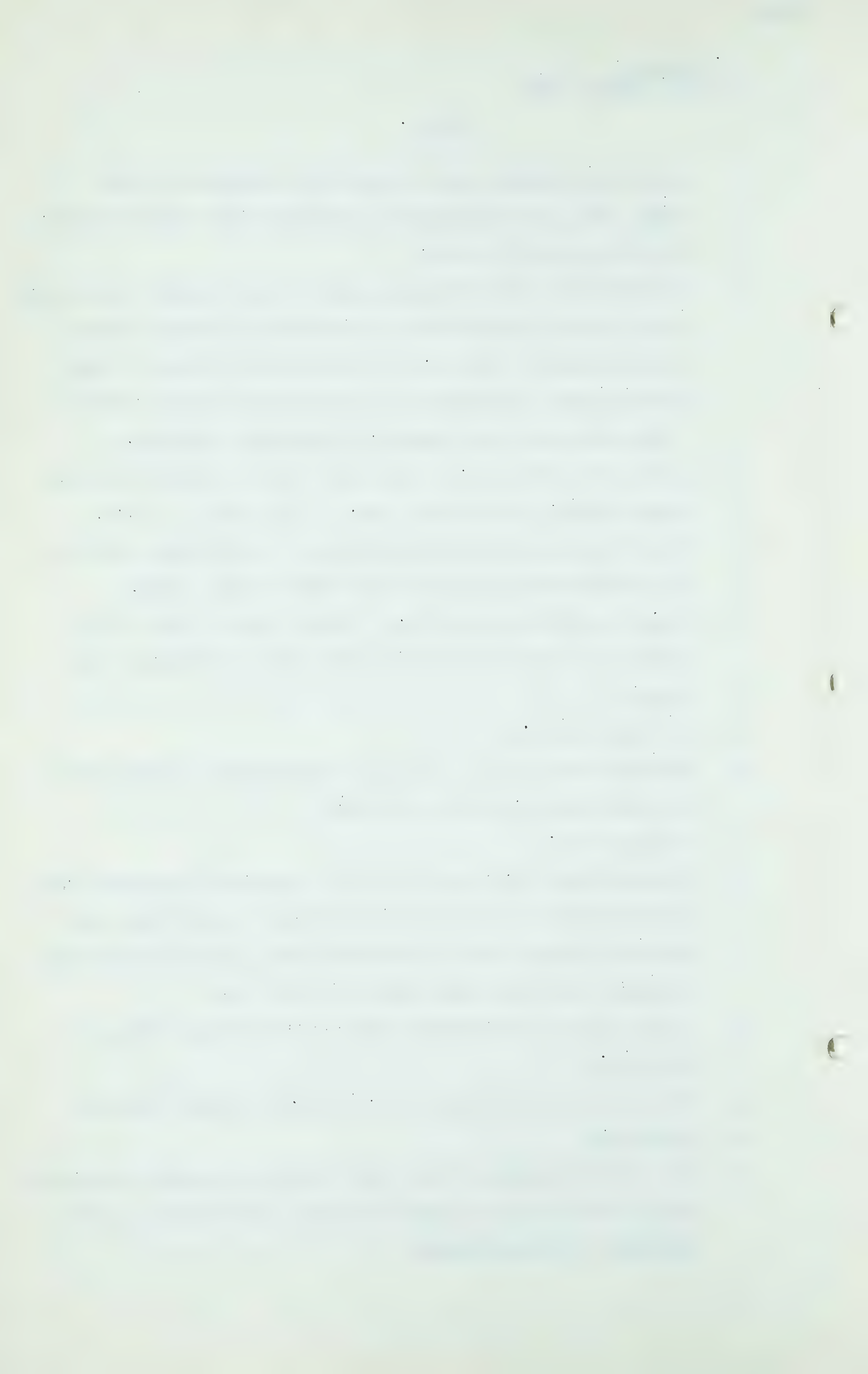
Q I understand, too, that there has been some indication that the Government of the Province intends to have their own gathering system in the Province itself under Governmental control, have you heard anything about that?

A I have heard some rumours about various things going on out there.

Q But we are on the rumour level, as Mr. Porter would say?

A Certainly.

Q But the fact remains that there has been no price discussion as yet between your company and these communities in the Province of Saskatchewan?



G. Whitney,
Cr. Ex. by Mr. Nolan
Cr. Ex. by Mr. S. B. Smith

- 2975 -

A I have had no price discussions.

Q Thank you.

.....

CROSS-EXAMINATION BY MR. S. B. SMITH:

Q Mr. Whitney, can you tell us about load factor? You dealt with that last year, didn't you, in your brief?

A I am not sure.

Q Well, didn't Exhibit, I am sorry, I have not got the number - you presented the estimated markets and gas requirements of Western Pipe Lines a year ago, didn't you?

A Yes, I did.

Q Well, you dealt with load factor there, page 9, and you say that operating under these conditions it is expected that the sales load factor in the fifth year would be approximately originally 68, I think it was changed to 65, per cent. Are you going to deal with load factor, or is someone else? You do not know?

A If you ask me.

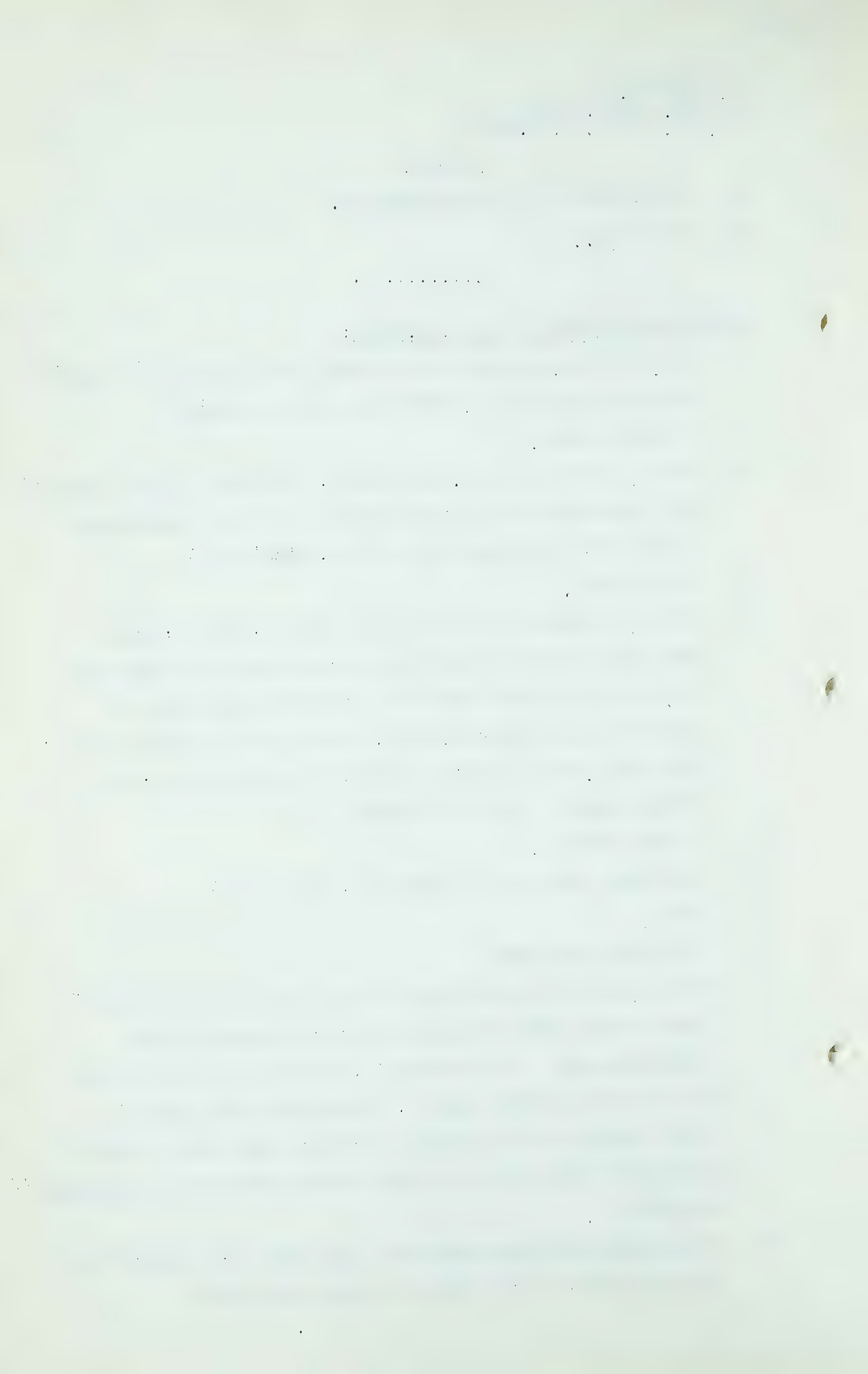
Q You might tell me if I ask you, is that it?

A Yes.

Q I will ask you then.

A Well, these peak days which we have calculated are calculated on the basis of being current at the end of the operating year. For example, a peak day of 264 occurs at the end of the fifth year. During the fifth year we would expect that the weighted average peak would be about 253, and on that basis the load factor would be just slightly over 80%.

Q It has gone up a long way since last year, has it, then? Up from 65%, that is the figure you gave last year?



G. Whitney,
Cr. Ex. by Mr. Smith
Cr. Ex. by Mr. Macleod

- 2976 -

A It is better on this basis.

Q Yes. Now, is the interruptible in Saskatoon, Prince Albert and Regina, of any importance to you, in assisting you in respect to your load factor? It is quite important, isn't it?

A It is part of the sales. It does not make or break the system, I am sure of that.

Q No, but it is quite an important element though?

A It is a pretty small portion of our sales.

Q Well, it totals, what is it? I have the total somewhere.

A Something on the order of 5 billion.

Q Yes, 5 billion 500 million, I think, isn't it? It is a very useful thing for you to have?

A It is nice to have an interruptible load, yes.

Q All right.

.....

CROSS-EXAMINATION BY MR. MACLEOD:

Q I would like to refer to your submission, Exhibit 106, the last paragraph?

A Yes.

Q The agreement that you refer to there is the one that was marked Exhibit 104?

A Yes, it is.

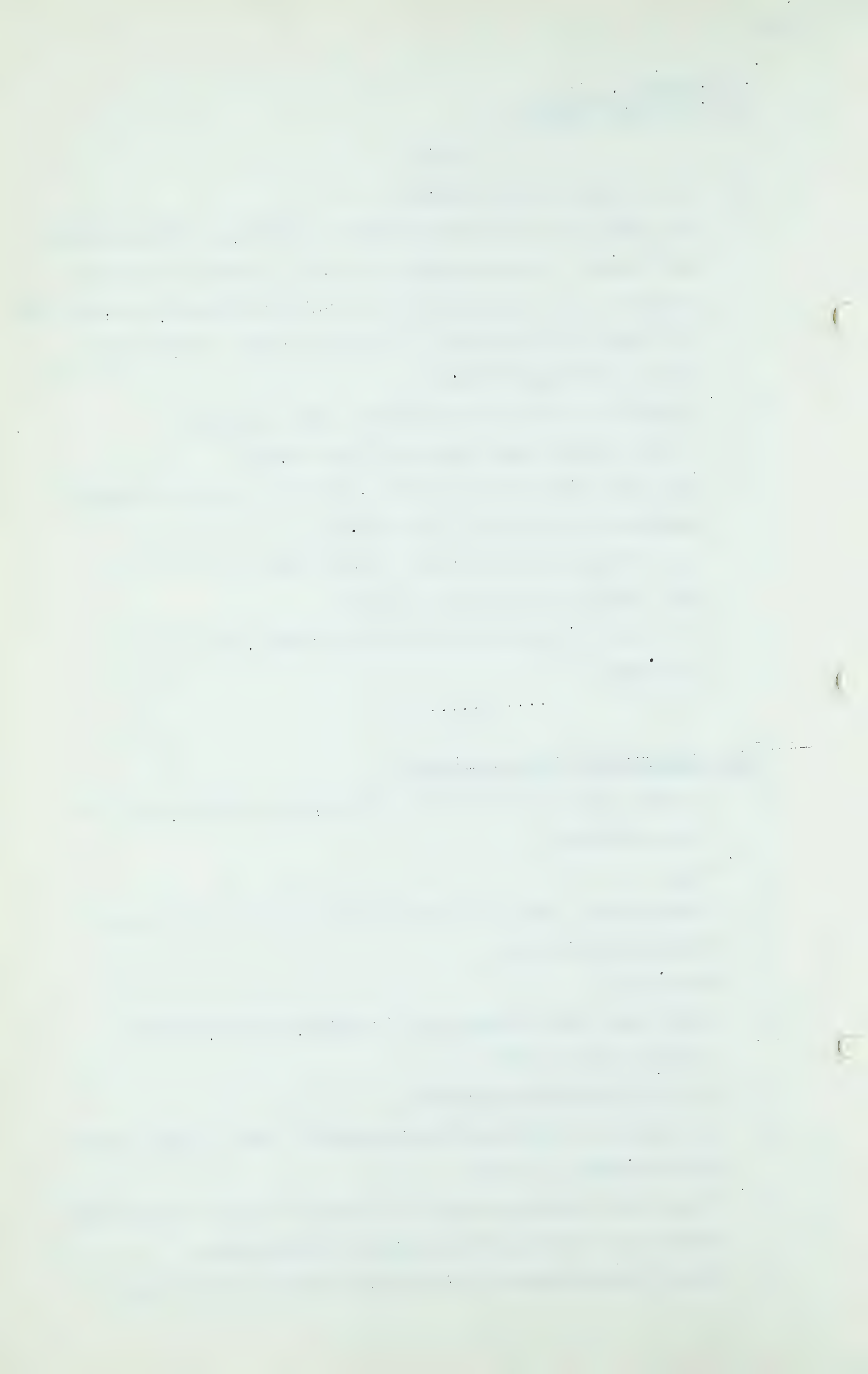
Q Where does that obligate you to deliver 150,000 Mcf.? I read it as 100,000?

A It is the minimum obligation.

Q And there is nothing in the contract? That is not a correct statement, is it?

A Well, the obligation under the contract is for the capacity which is in excess of the Canadian requirements.

Q Your firm obligation is to deliver 100,000 Mcf per day?



G. Whitney,
Cr. Ex. by Mr. Macleod

- 2977 -

A No, I do not agree with that.

Q Where do you find that in your contract?

A The obligation in the contract, as I see it, is for the capacity between the designed capacity and the requirements of the Canadian market, and at the present time it looks like 150 is about the figure.

Q Would you refer to Clause 3 on page 8 of the agreement?

A I do not have the contract here.

MR. MARTLAND: Here is one here. Also Clause 4.

Q MR. MACLEOD: Clause 3 is the one in which you agree to have available a minimum of 100 million cubic feet per day?

A A minimum of 100 million.

Q Yes?

A Yes.

Q And then (4) you agree to supply export to the extent that you have available. That is not a firm commitment?

MR. MARTLAND: Yes, it is.

A Yes, it is, as I see it. That is the clause under which we arrive at this 150.

Q MR. MACLEOD: And supposing that you have nothing further available for export?

A Than what?

Q Than 100 million?

A The contract quantity is 100 million.

Q That is what your firm commitment is, 100 million cubic feet per day?

A I do not agree with that.

Q All right. Now, you know something about the Pakowki Lake area?

G. Whitney,
Cr. Ex. by Mr. Macleod

- 2978 -

A No, I do not.

Q Which McColl-Union, McColl and Union of California are seeking to export, and which is included in the gas that you take, or are asking to take?

A No, I am not familiar with the reserve picture there. I have heard your evidence, but that is the extent of it.

Q Do you know what the available gas from these fields is that the Board has found to exist?

A No, I do not.

Q Will you take my word for it that it is 315 million?

A From where?

Q 315 billion?

A From where?

Q From those fields?

A From which one?

Q The Pakowki Lake field?

A Well, you probably know it, I do not.

Q If you reduced your deliveries to the Northern Natural Gas to what your firm commitment is, 100 million cubic feet a day, how much would that amount to in the 20-year contract, that is, if you take 50 million a day off?

A Take 50 million a day off?

Q Yes?

A Our total?

Q Off your total deliveries to Northern Gas Company?

A Yes.

Q It would amount to what in the 20-year contract, roughly?

MR. MARTLAND: Do you need your slide rule?

A I can do the multiplication, if that is what you would like.

Q MR. MACLEOD: All right.



G. Whitney,
Cr. Ex. by Mr. Macleod

- 2979 -

A 18,250,000,000 per year..

Q How much for the 20-year period, roughly?

A 365 billion.

(Go to page 2980)



Gordon Whitney,
Cr. Ex. by Mr. Macleod.
Cr. Ex. by Mr. Milvain.

- 2980 -

Q If I am correct in my statement that the gas reserves in the Pakowki Lake is 315 billion, if you eliminated that you could still meet your firm commitments to this Northern company and have some to spare?

A Well, I am not sure how our supply is set up. I do not know how much it is proposed to take out of Pakowki Lake.

Q But you still, by reducing that by that, or the deliveries by that 50 million, you reduce it by an amount which is in excess of our total reserves, do you not?

A If those total reserves are reduced by an excess of 315 billion.

Q So that if the Board allowed us to export our full usable gas from the Pakowki Lake, unless you got it from somewhere else, which you probably might do, you would not have any available over your 100 million, is not that right?

A You say if we got that much supply from Pakowki Lake?

Q Yes, but if the Board gives us the right to export our full amount you might get it somewhere else, but if you did not you would still have enough to meet your firm commitments to this company of 100 million a day?

A If our supply set up is on the basis of taking that from Pakowki Lake, I think your statement follows.

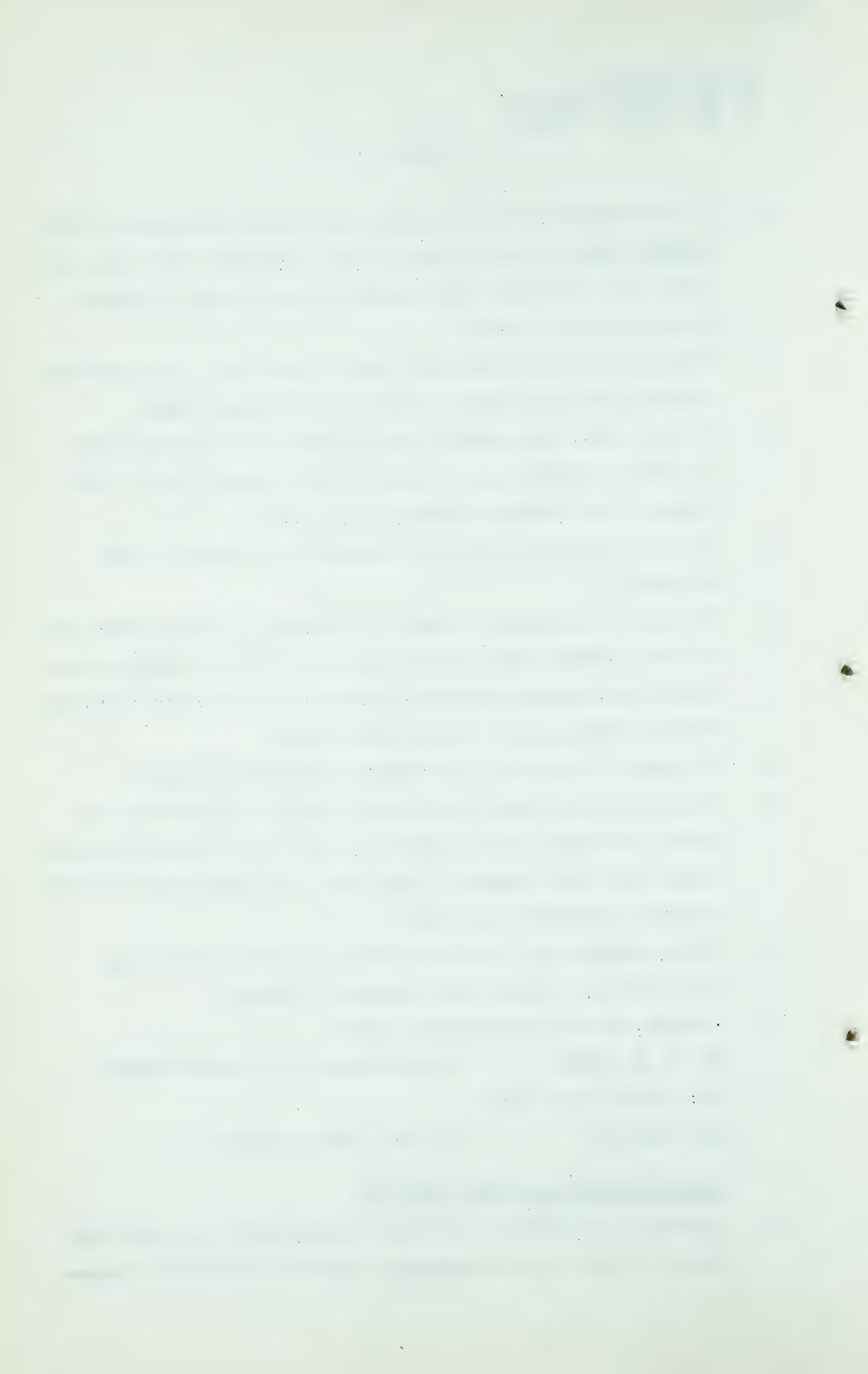
Q I think you are taking all we have.

MR. C. E. SMITH: Mr. Whitney -- is there anybody else ready down there?

MR. MILVAIN: I have a few questions.

CROSS-EXAMINATION BY MR. MILVAIN:

Q I notice, Mr. Whitney, looking at exhibit 105 which was submitted by the City of Winnipeg, Table W on page 40, it shows



Gordon Whitney,
Cr. Ex. by Mr. Milvain.

- 2981 -

the total annual sales at the end of the first year as being 1,522,000. Do you notice that?

A Yes.

Q And if you look at Appendix 4 of exhibit 106 that you just put in, it shows total annual sales in the Winnipeg metropolitan area as being 3,369,500 or something more than twice the amount shown in the Winnipeg exhibit?

A That is principally because in my figures I have included the cement plant in the first year.

Q That is the cement plant that the Winnipeg people do not include until the second year?

A He does not have it in until the second year, I believe.

Q That is the explanation of the difference between those two figures?

A I think that is the principal difference, yes.

Q There are one or two other general things I want to ask you, sir. On page 4 of your submission you have some comparative fuel prices. Can you tell us the BTU value and the efficiency basis you used in making those comparisons?

A I assumed no efficiency factor, merely on a straight BTU conversion.

Q Take Drumheller Stoker coal, for instance, what BTU value did you take?

A I have a sheet here with that information on it. It seems to me we used 9700 BTU per pound. Yes, 9700 BTU per pound.

Q And for briquettes?

A 13,000 BTU per pound.

Q Coke?

A 13,000 BTU per pound.



Gordon Whitney,
Cr. Ex. by Mr. Milvain.

- 2982 -

Q And for lignite?

A I believe that is 7,000 BTU per pound.

Q And for No. 2 fuel oil?

A 170,000 BTU per pound.

Q You say you took no efficiency factor at all into consideration?

A No efficiency factor.

Q Now, at page 6 it is expected that gas can replace high grade coal and light oil. Do you expect it will not replace other than high grade coal?

A I do not expect it is going to replace the lignite and the lignite fines which are used by some of the processing plants in the Winnipeg area.

Q Do you know what percentage does this high grade coal you refer to make to the total fuel consumption of coal in the area of Winnipeg?

A Not of the total consumption. I have a detailed list of each plant which is included in the estimate.

Q I take it that having surveyed it you found a certain amount of coal was being used and you must have estimated that you could replace a certain percentage of it?

A No. The firm industrial estimates which are included represent the precise fuel consumptions of specific plants.

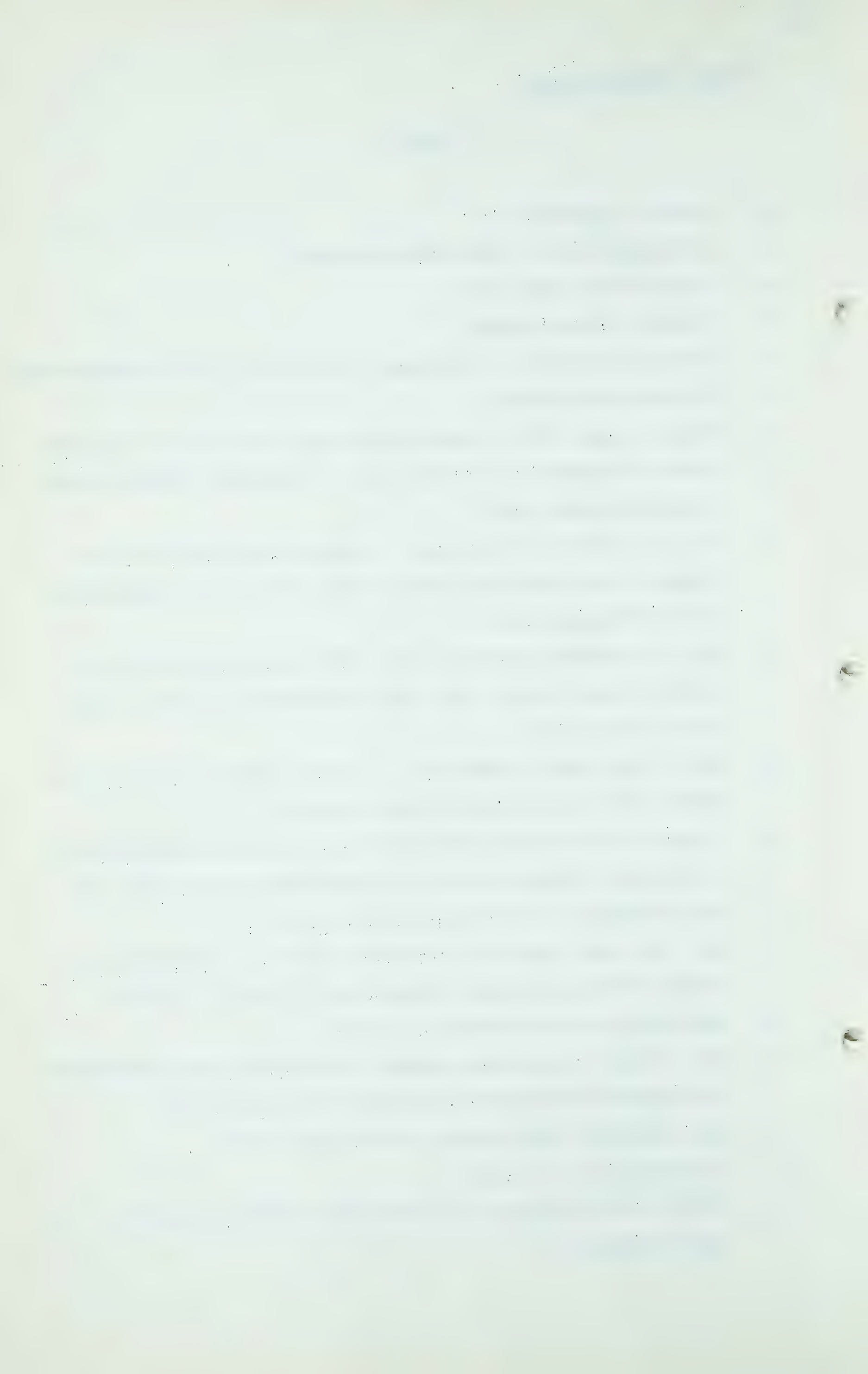
Q Can you give me an example of that?

A Yes. There is a malting company in Winnipeg using anthracite. The estimated annual use was about 96 million feet.

Q You think you could displace that type of use?

A I am quite sure we could.

Q In the table on page 4, is there any of that high grade coal included?



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- A This table on page 4 represents fuels for domestic purposes. In the text below I state the approximate cost of bituminous coal and high grade oil.
- Q So we can put it this way, so there is no high grade coal included in the table on page 4 because that table deals only with domestic fuels?
- A Well, that is one reason. High grade coal is not an important fuel in the Winnipeg area for domestic purposes.
- Q So that when you say further down on page 4, "The cost of lignite for industrial purposes varies between 24 cents and 30 cents per million BTU at various points along the pipe line route", you do not feel that you could displace that use?
- A Except in the two power stations which I have included in the interruptible market.
- Q And those were the ones in Prince Albert and in Saskatoon?
- A Yes.
- Q Yes, you put those in as interruptible installations?
- A Yes, that is the only basis I think that this type of fuel can be replaced.
- Q The only way you could hope to continue to serve them as customers would be so long as you could compete with other fuels?
- A In all events we would expect to compete with other fuels and continue to.
- Q The only basis upon which you hope to be able to sell to that interruptible customer is that you think you can undersell his lignite at 24 to 30 cents?
- A There are other considerations than price in switching from coal or oil to gas.



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Q But that is the competition you look to in selling gas to those two interruptible customers you mention?

A That is a guide to it, yes.

Q If, as has been suggested, the Province of Saskatchewan set up some sort of a gas gathering system within its Province, that might be another factor with which you would have to compete?

A Yes, I guess it would if it did it.

Q Perhaps with a Government of that complexion, it might be difficult to compete?

A I do not anticipate so.

Q We won't get you mixed into politics.

A Thank you.

Q Now, seriously, the position would be this, if the Province of Saskatchewan did take over the gathering of gas, if they find it there, they might be prepared, because of their Governmental position, be prepared to set prices that would be difficult to compete with?

A If they happened to find a gas field right under the major market it might be true.

Q If it was near to either Saskatoon or Prince Albert?

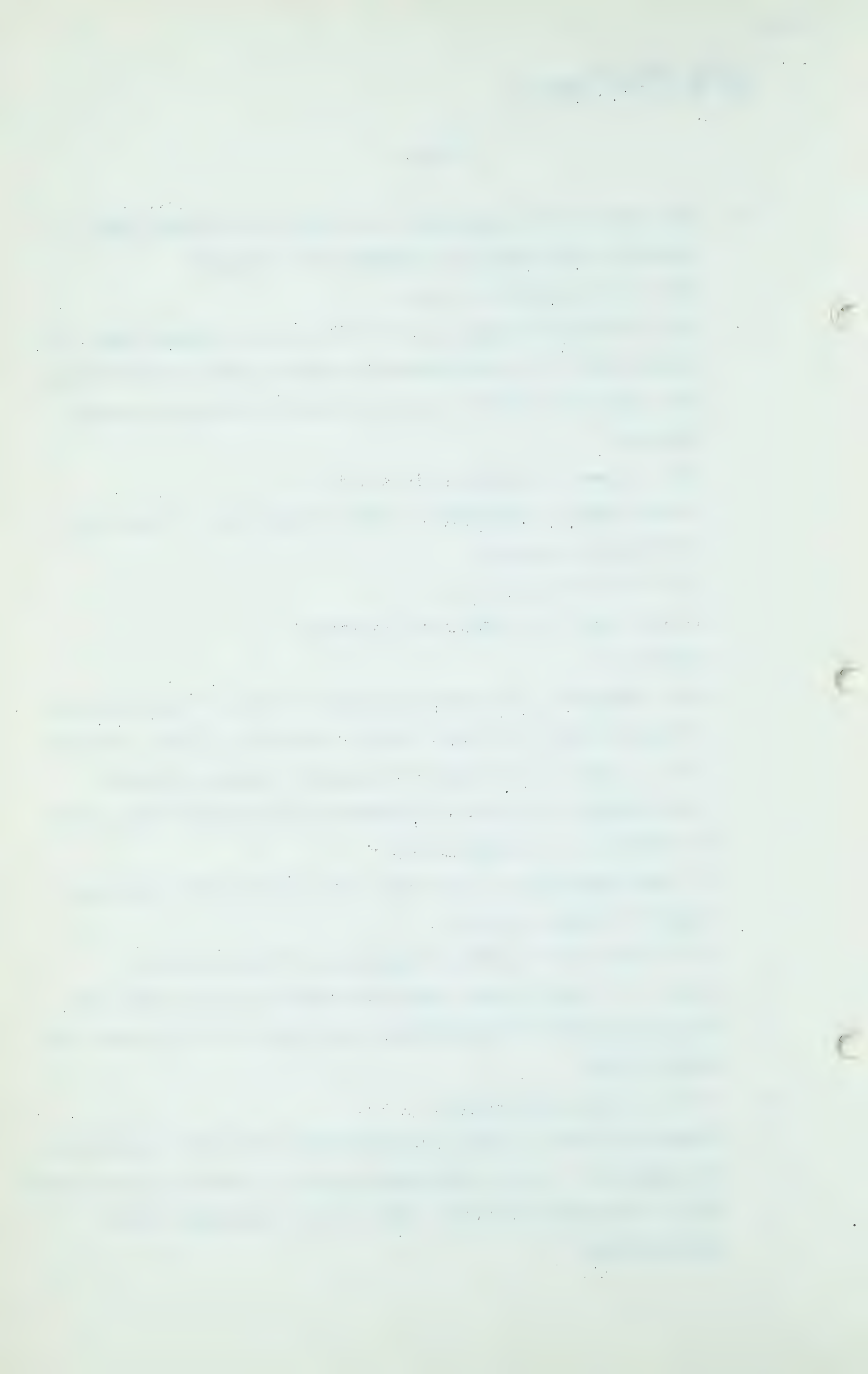
A Well, it is hard to say where the breaking point would be.

Q Why do you think they would pay more than 24 to 30 cents per million BTU?

A I did not say they would.

Q Because you say in your own submission here that lignite is inexpensive. It is a satisfactory fuel, I take it, up to now?

A Yes, I have been in plants where it is considered quite satisfactory.



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Q So you would not expect plants that are presently using lignite at 24 to 30 cents, and being satisfied with it, to pay more than that per BTU for their fuel, would you?

A Not on an interruptible basis, probably not.

Q And you only, in your whole plan you deal with them as being on an interruptible basis?

A Those two power stations, yes.

Q I notice on looking at the table you made up as appendix 4, that these interruptible customers other than in Winnipeg, that you dealt with in the Winnipeg submission, are just those two power plants you speak of, that is at Prince Albert and Saskatoon?

A Three power plants.

Q Yes, I say two. I mean at the two points.

A There are three points, Regina, Prince Albert and Saskatoon.

Q Oh, yes, that is right. Saskatoon, Prince Albert and Regina. I took from your fifth year items that were shown at Saskatoon, Prince Albert and Regina of 21,284,000; 651,800 and 1,313,500 and totalled them and got a total of 4,093,700. Is that about right?

A You are adding these three interruptible sales?

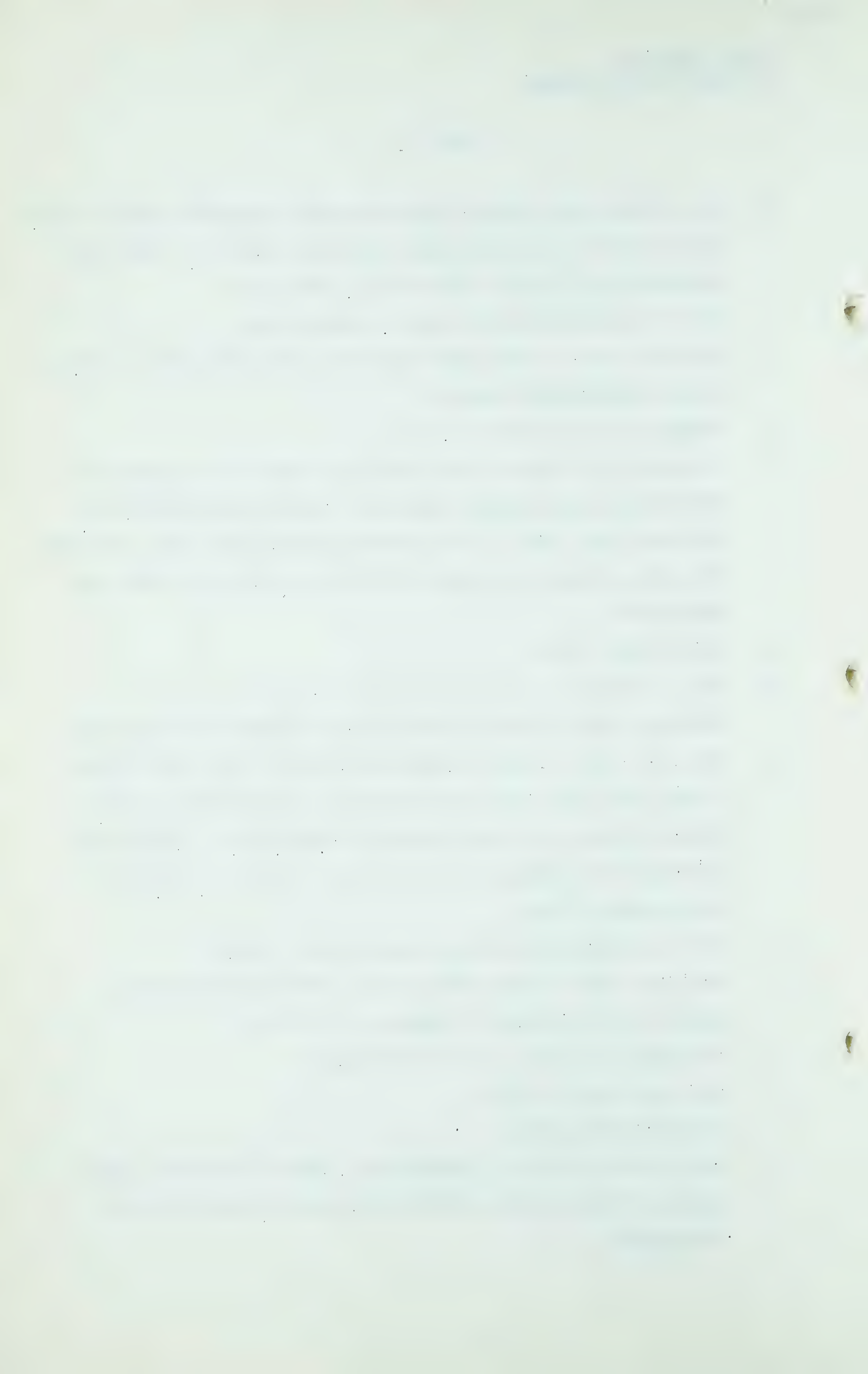
Q Yes, for those interruptible sales other than those that might be in Winnipeg, if there are any there.

A No, there are none listed in Winnipeg.

Q No, none there at all?

A It is in that order.

Q Now, at the end of the fifth year I take it that the total Canadian sales are the difference between 74,330,000 and 54,750,000?



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A That is correct.

Q Or 19,580,000?

A That is my figure.

Q So that the interruptible sales at these three plants we are speaking of represent in the neighbourhood of about 20%, a little better than 20% of the whole of the Canadian total, is that right?

A It is in that range, yes.

Q So that if you were unable to maintain or retain that interruptible load, it would have some rather serious consequences on your sales, would it not?

A No, I do not think so. I do not think in the first place there is any danger of us not being able to retain it.

Q Would not a reduction of 20% of those sales be a matter that would be considered somewhat serious?

A Just make more gas available for other customers.

Q Provided you got the other customers?

A All right.

Q Is that right?

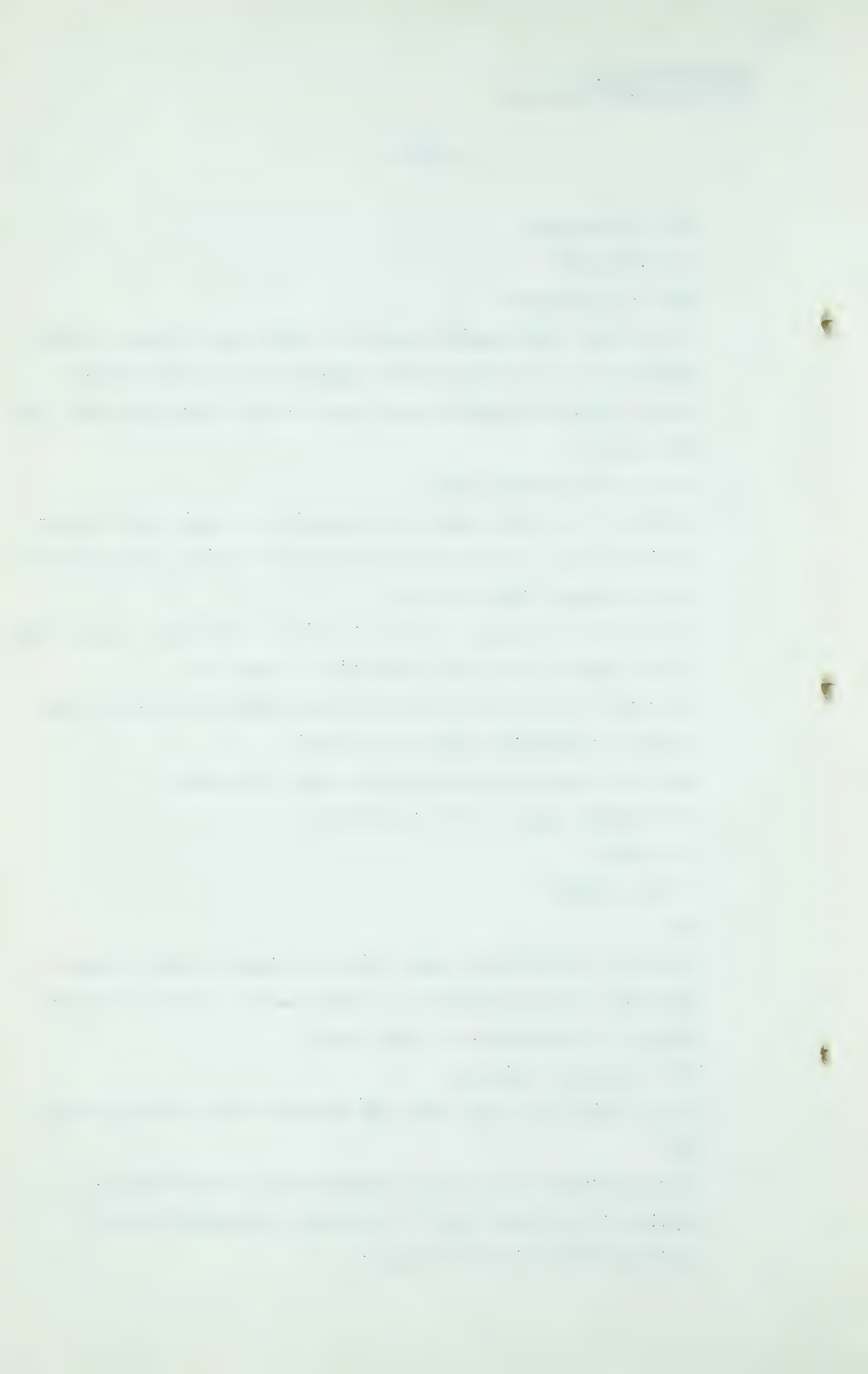
A Yes.

Q The fact is if you did have a loss in sales of 20% of your Canadian sales it would be a serious matter unless you could replace it elsewhere, is that right?

A That is not my opinion.

Q So you think you could lose 20% without being bothered about it?

A I do not think the loss of 5 billion out of 74 billion, or a gain of 5 billion out of 74 billion, is going to be a deciding factor in the project.



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Q I am thinking solely of the Canadian sales at the moment.

Confine yourself to that, and think that is all you may have for the moment. Would that then be serious?

A You are asking me to assume we have only the Canadian market?

Q Yes?

A And we lose 5 billion of it?

Q Yes?

A Well in the first place if we have only the Canadian market we are going to have high priced gas, and if we lose 5 billion it is going to be higher priced.

Q It will run up the price to the other consumers?

A If the pipe line works out, it would.

Q It would have to do that, it would be inevitable, would it not?

A It is quite obvious.

Q And when you are looking at this exhibit for a moment, Mr. Whitney, I know several of my learned friends have dealt with the percentage as between Canadian and American sales, but in order that I can have it at least clear in my mind, I would like to go back at it for a moment. Dealing first of all with the first year's operation, your total annual sales are 53,238,900?

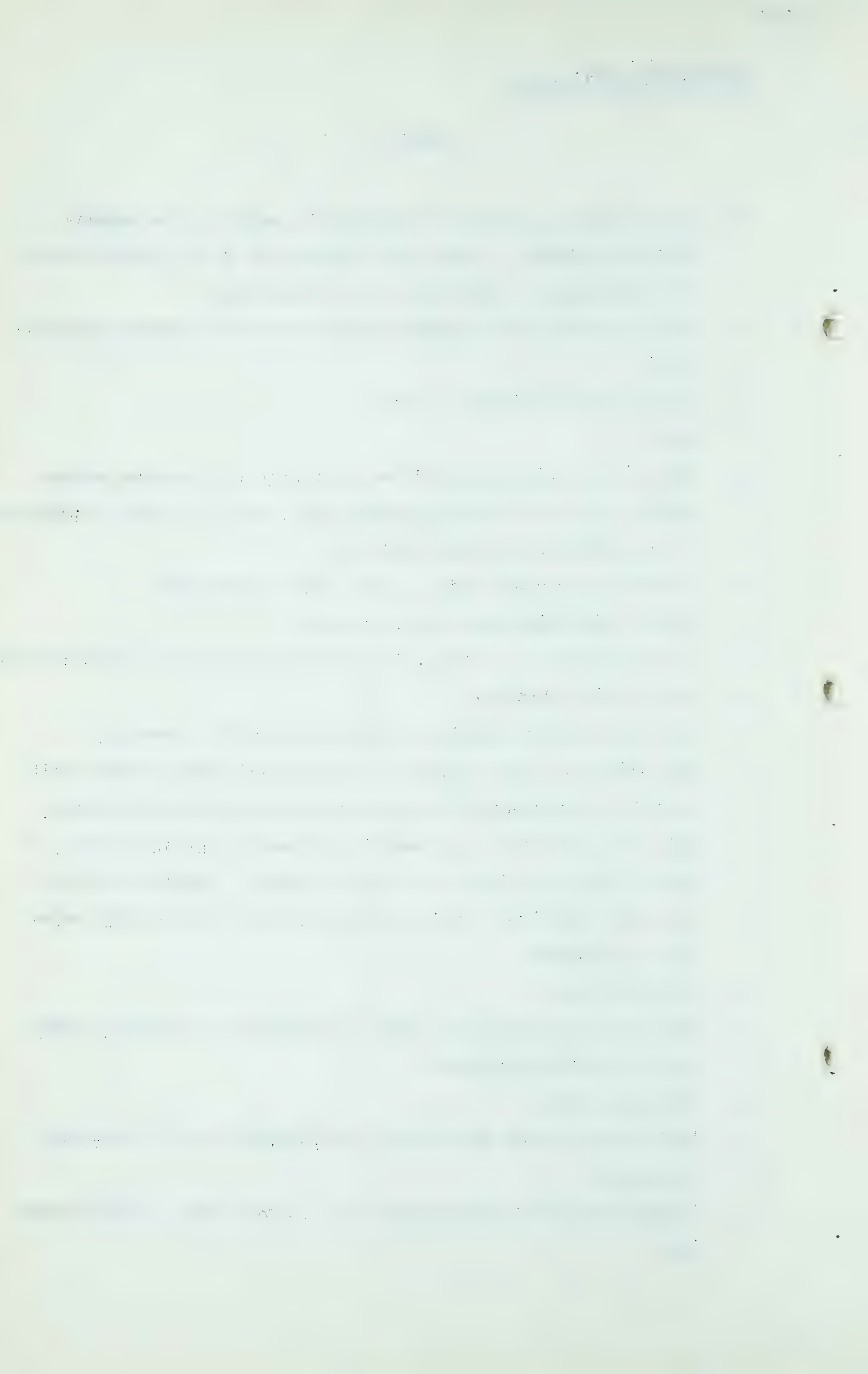
A That is right.

Q Of which 44,621,000 are sales to Northern Gas Company, which is in the United States?

A That is right.

Q That means to say there would be 8,617,900 sold to Canadian customers?

A I have not made that calculation. If you have, I will accept it.



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Q If my subtraction is right, that is the figure?

A All right.

Q And again, if my mathematics are anywhere close to being right, that is, in round figures, 20% Canadian sales and 80% American sales?

A Better than I thought it was, yes, in that range.

Q And in the fifth year, making the same calculation in round figures, we are 25% Canadian sales and 75% American sales?

A My figures are 26 and 74.

Q But it is in that approximate range?

A Yes.

Q Now, I would like to come to this contract, exhibit 104. Mr. Macleod, I think, showed it to you, and this morning in speaking to Mr. Williamson I mentioned the paragraph on page 7 of that contract that deals with taconite. Can you tell us something about that, or is there somebody else knows about that?

A Well, it is in the Minnesota area. I think Mr. Merriam was the designated expert this morning.

Q Is Mr. Merriam the expert on this deal?

MR. C. E. SMITH: He is the catcher.

MR. MILVAIN: Perhaps I had better ask Mr. Merriam about it. It is 4 o'clock, sir.

THE CHAIRMAN: We will adjourn until the morning.

(The hearing then adjourned until 9 A.M. December 12th, 1951.)

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Cr. Ex. by Mr. Milvian.

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Q If my subtraction is right, that is the figure?

A All right.

Q And again, if my mathematics are anywhere close to being right, that is, in round figures, 20% Canadian sales and 80% American sales?

A Better than I thought it was, yes, in that range.

Q And in the fifth year, making the same calculation in round figures, we are 25% Canadian sales and 75% American sales?

A My figures are 20 and 74.

Q But it is in that approximate range?

A Yes.

Q Now, I would like to come to this contract, Exhibit 104.

Mr. MacLeod, I think, showed it to you, and this morning in speaking to Mr. Williamson I mentioned the paragraph on page 7 of that contract that deals with facsimile. Can you tell us something about that, or is there somebody else knows about that?

A Well, it is in the Minnesota area. I think Mr. Merriam was

the designated expert this morning.

Q Is Mr. Merriam the expert on this deal?

MR. G. E. SMITH: He is the catcher.

MR. MILVIAN: Perhaps I had better ask Mr. Merriam

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The Province of Alberta

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

Application for Permission to Remove or cause to be removed
Natural Gas from the Province of Alberta, under the Provisions of the
Gas Resources Preservation Act by Prairie Pipe Lines Limited.

I. N. McKinnon Esq., Chairman

D. P. Goodall Esq.

Dr. G. W. Govier

Session:

Volume_____

